

Vol. III

MAY, 1917

No. 5

The
INTERNATIONAL
JOURNAL
OF
ORTHODONTIA

A Monthly Journal Devoted to the Advancement of the Science of Orthodontia

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PUBLISHED BY
THE C. V. MOSBY COMPANY
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The International Journal of Orthodontia

Editor: Martin Dewey, D.D.S., M.D.

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ST. LOUIS, MAY, 1917

No. 5

ORIGINAL ARTICLES

THE DECIDUOUS MOLARS AND THEIR RELATION TO THE DEVELOPMENT OF THE JAWS*

BY CHARLES R. BAKER, D.D.S., EVANSTON, ILL.

TWO of the principal causes of malocclusion are the premature loss of the deciduous molars, and the too long retention of the deciduous molars. Dr. E. H. Angle, in speaking of the prolonged retention of deciduous teeth, states that "in this event the succeeding tooth will either be prevented from erupting, or it will be deflected into malocclusion." I am convinced that the too long retention of deciduous molars may exert a much more important influence on occlusion. I have been unable to find in any of the literature that I have examined on the subject of the development of the jaws and eruption of the teeth, any positive statement regarding the exact time the deciduous molars should be lost from the arches, or any plausible explanation of the adjustment of the space when the deciduous molars are replaced by bicuspid, which occupy much less mesio-distal space in the arches. One statement, credited to Blair in Brophy's "Oral Surgery" is to the effect that "the extra space is used partly by the permanent cuspids and partly by the first permanent molar moving forward." This may be the correct explanation, but it would seem more logical if both bicuspid and the cuspid erupted at the same time; but the first bicuspid normally erupts at the age of ten and the second bicuspid at eleven, at which time there is usually normal proximal contact between the bicuspid and first molar, due probably to the pressure exerted by the developing second molar; so that it seems reasonable to believe that space is made for the increase in size of the permanent cuspid over that of the deciduous cuspid by a lateral growth of the jaw. In some cases the permanent cuspid erupts before either deciduous molar is lost, and assumes a normal position in the arch.

The deciduous first molars erupt in the average case at the age of two years, and the development of the roots is completed at the age of two and one-

*Read before the Alumni Society of the Dewey School of Orthodontia, Chicago, Ill., March 14, 1917.

half years. The deciduous second molars erupt in the average case at the age of two and one-half years, and the development of the roots is completed before the child is three years old. Absorption of the roots of the deciduous first molars begins at the age of seven and one-half years, and absorption of the roots of the deciduous second molars begins when the child is eight and one-half years.

In the normal development of the teeth and jaws, the permanent first molars easily assume their positions, to the distal of the deciduous second molars.

<i>Discrepancy in size</i>	2.5	1.8	.6	.1	1.4				
<i>Deciduous teeth upper</i>	6.6	5.1	7.0	7.8	6.6				
<i>Permanent teeth upper</i>	7.0	6.9	7.6	7.5	6.8	10.7	9.8	9.6	
<i>Permanent teeth lower</i>	5.9	5.9	6.7	6.7	7.1	11.5	10.7	10.7	
<i>Deciduous teeth lower</i>	6.0	4.7	6.0	7.7	5.9				
<i>Discrepancy in size</i>	1.2	1.5	1.7	.8	2.8				

Figures illustrate average mesio-distal width of teeth in millimeters

Fig. 1.—Showing the relative mesio-distal widths of the deciduous and permanent teeth. (Sizes are taken from the table of averages as given in Dr. G. V. Black's "Dental Anatomy" and shown in millimeters.) Note that while the permanent incisors and cuspids are wider than the corresponding deciduous teeth, the bicuspid occupy less mesio-distal space than the deciduous molars.

The permanent incisors meet with practically no hindrance in their movements during eruption; they are wider mesio-distally than the deciduous incisors, but during the development of these teeth the jaws have increased in width in the incisor region to accommodate them, and the deciduous incisors have been lost, so that they are guided into position between the fully developed deciduous cuspids by the pressure of the tongue and lips. Let us compare the average mesio-distal width of the deciduous and permanent teeth as given in Black's "Dental Anatomy." (Fig. 1.)

It will be noted that there is a great discrepancy in size of the deciduous

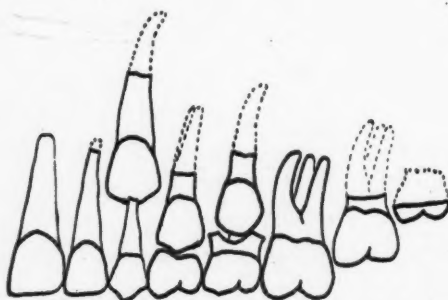


Fig. 2.—Showing the average amount of development of the teeth at the age of ten when the first bicuspid is due to erupt.

molars and their successors, the bicuspid, and that in this case the permanent teeth are smaller mesio-distally than the deciduous teeth, while the reverse is true in the case of the incisors and cuspids. It will also be noted that while the permanent first molars and incisors assume their positions in the arch with comparative ease, the exchange of the deciduous molars for bicuspid is a much more complicated matter, for these changes take place between two areas that are occupied by fully developed teeth and well developed alveolar process. (Fig. 2.)

Unless the exchange from the deciduous molars to bicuspid is practically normal, the final occlusion will not be normal. Unless the upper and lower arches (each lateral half being considered separately) develop uniformly and harmoniously in the deciduous molar region, the result will be malocclusion, usually too great an over-bite of the upper anterior teeth. The extent of the

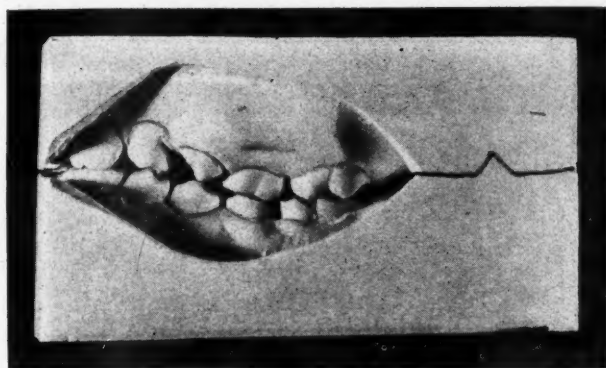


Fig. 3.—Both lower bicuspid, upper first bicuspid and upper deciduous second molar are in place. The permanent first molars occlude normally but the upper second deciduous molar occupies so much space that the upper first bicuspid and all of the teeth anterior to it are held in abnormal occlusion. This deciduous molar should have been removed from the arch as soon as the lower second bicuspid had fully erupted.

over-bite of the upper anterior teeth is one of the most important features of occlusion. Too great an over-bite will certainly prevent normal grinding of food by the bicuspid and molars; too short an over-bite will prevent normal incising of food, and in some cases indicate that the posterior teeth are abnormally elevated, or that there is a lack of development of the upper jaw.

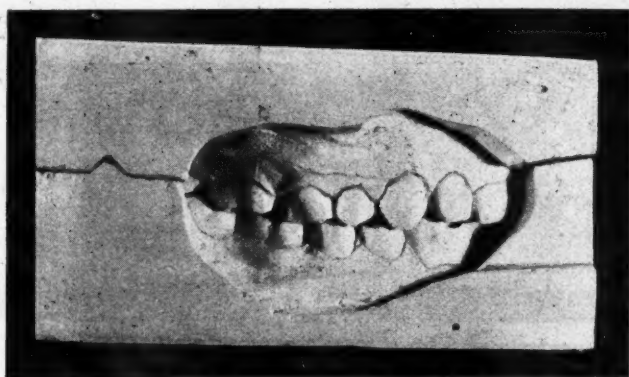


Fig. 4.—Same number and kind of teeth in place as in Fig. 3, but in this case, the first bicuspid are in normal occlusion and the upper deciduous second molar is producing malocclusion of the permanent molars.

An upper deciduous molar must be lost from the arch at approximately the same time that the corresponding lower deciduous molar is lost, or the result will be malocclusion. Normal occlusion can not be produced if there are deciduous molars in one jaw and bicuspid in the opposing jaw (on the same side of the mouth), for the teeth will not be of the proper mesio-distal width to harmonize. Under these circumstances, if there is proximal contact in both

arches, there will be malocclusion either anterior or posterior to the deciduous molar region. (Figs. 3, 4, 5 and 6.)

To have the final occlusion normal, it is necessary to have the dental arches harmonize in the deciduous molar region as to number and kind of teeth throughout the entire development of the arches; they must develop symmetrically. (Figs. 7, 8 and 9.)

The idea that all deciduous molars should be kept in the arches as long

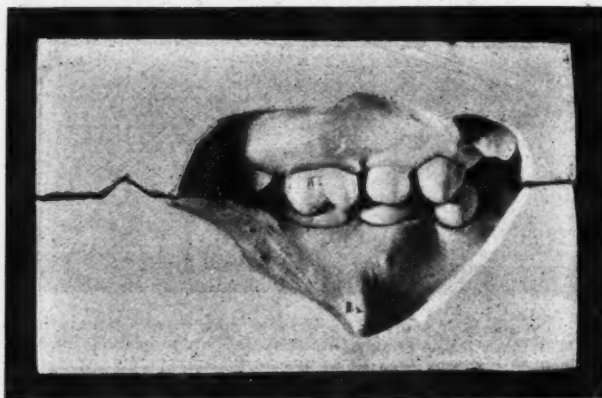


Fig. 5.—Both upper bicuspid, lower first bicuspid and lower deciduous second molar are in place. First bicuspid occlude normally but the mesio-distal width of the lower deciduous second molar is maintaining malocclusion of the permanent molars.

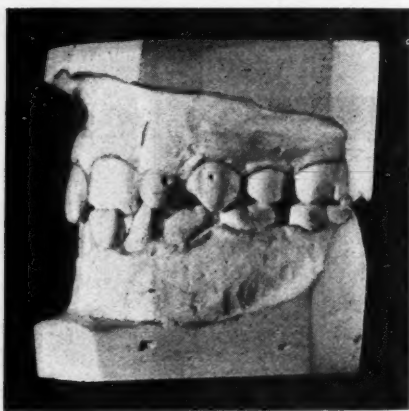


Fig. 6.—This shows the lack of harmony in size in the deciduous molar region when both bicuspid are present in one jaw and both deciduous molars in the other.

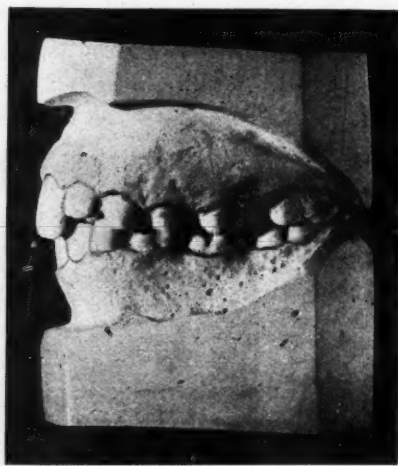


Fig. 7.—Illustrating normal development in the deciduous molar region. Both upper and both lower deciduous molars are present and there is normal occlusion of permanent first molars, deciduous molars and cuspids.

as possible is wrong. There is a definite time when each deciduous molar should be lost. It is important to keep the lower deciduous molars in the arch until the lower bicuspid are ready to erupt, but as soon as the lower first bicuspid erupts, the upper deciduous first molar should be removed from the arch. As soon as the lower second bicuspid erupts, the upper deciduous second molar should be removed from the arch. This will permit harmony in the size of the jaws as they develop. The upper deciduous molars should be removed at

the proper time regardless of the physical condition of the teeth themselves or the age of the patient. It is a matter of the relation of the individual tooth to the development of the jaws. In cases where both lower bicuspid have erupted and both upper deciduous molars are still in place, and the mesio-distal occlusion of the permanent first molars is normal (Fig. 10), the upper deciduous molars will occupy too much mesio-distal space to harmonize with that

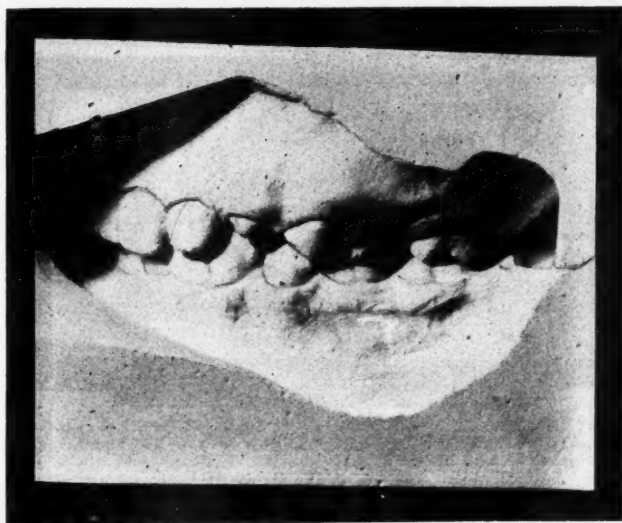


Fig. 8.—The next step in normal development in the deciduous molar region. First bicuspid, second deciduous molars and permanent first molars in normal occlusion.

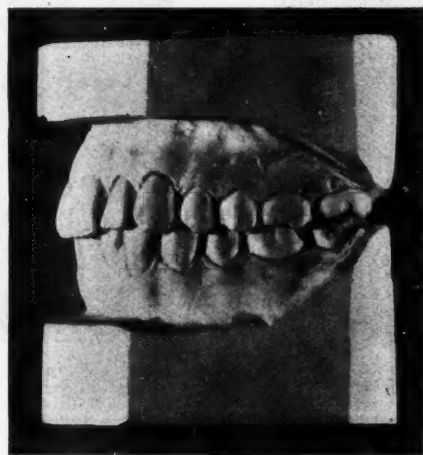


Fig. 9.—Normal occlusion, the result of normal development in the deciduous molar region.

occupied by the lower bicuspid, and as a result the upper anterior teeth will be held too far forward to occlude with the lower anterior teeth. This lack of occlusion during a period of rapid growth usually results in an elongation of both the upper and lower anterior teeth. All of the force of occlusion is sustained by the posterior teeth instead of being distributed over both entire arches, which tends to keep the bite of the posterior teeth short and increase the over-bite of the upper anterior teeth. Now, in this case, when the upper

deciduous molars are eventually lost and the bicuspid erupt, the mesio-distal position of the bicuspid will probably be normal, or nearly so, but the patient will still have the great over-bite of the upper anterior teeth—a serious form of malocclusion—and this condition might have been prevented by extracting the upper deciduous molars at the proper time. (Fig. 11.) In some cases, instead of holding the upper anterior teeth forward and away from the lower teeth, the pressure of the upper lip is sufficient to move the upper anterior

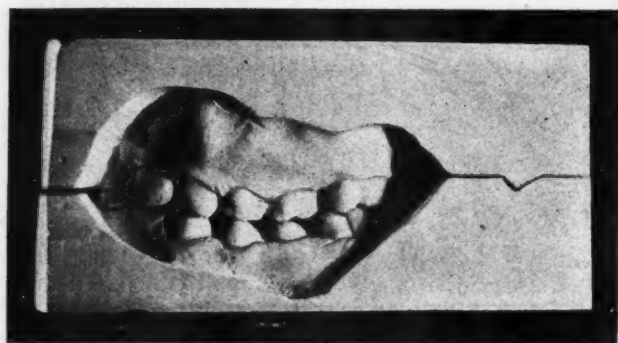


Fig. 10.—Both lower bicuspid and both upper deciduous molars are present and the permanent molars occlude normally. Note that the deciduous molars occupy so much mesio-distal space in the upper arch that the anterior teeth are held in malocclusion.

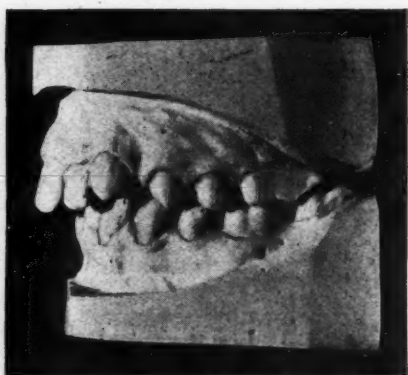


Fig. 11.—Showing the result of too long retention of the upper deciduous molars. The bicuspid and molars occlude practically as they should but there is a great overbite of the upper anterior teeth, a most unfortunate condition.

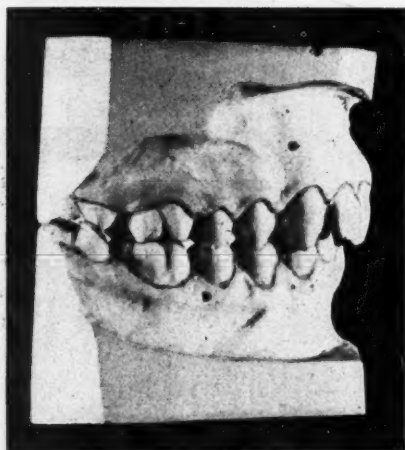


Fig. 12.—A form of malocclusion which may have been caused by the too long retention of upper deciduous molars.

teeth lingually, in which event there will be an overlapping of these teeth. (Figs. 12 and 13.) The too long retention of *one* of the upper deciduous molars, particularly the second molar, will produce the same form of malocclusion except that it will be less extensive. (Fig. 14.) This idea of mesio-distal harmony of the dental arches should be kept in mind during the treatment of all cases of malocclusion.

In regard to maintaining the space when a deciduous molar is lost prematurely: In the case of a lower deciduous molar, the space should be main-

tained until the bicuspid erupts, and the space maintained should be the mesio-distal width of the lost deciduous molar instead of the bicuspid that is expected, so as to harmonize with the corresponding upper deciduous molar. (Fig. 15.) When an upper deciduous molar is lost prematurely, or extracted after the eruption of the corresponding lower bicuspid, it is seldom necessary to maintain the space with an appliance, for the occlusion will usually keep the molars where they belong, and as the upper anterior teeth overhang the lower teeth, they can not move to the distal. However, in some cases the pressure of the

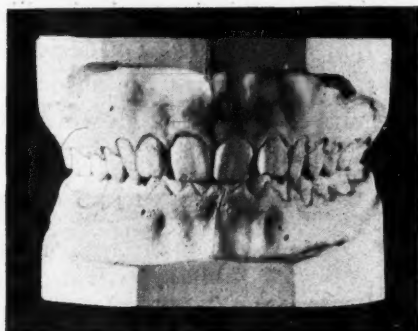


Fig. 13.—Another view of the casts shown in Fig. 12.

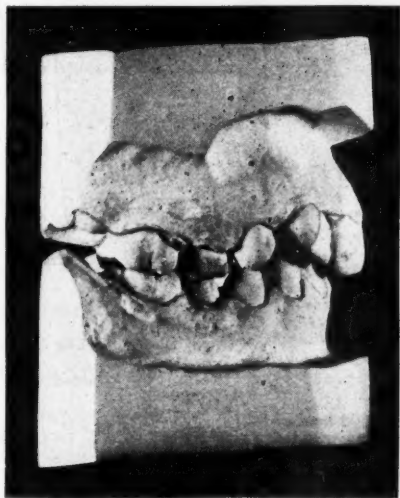


Fig. 14.—Note that while the permanent molars are in normal occlusion, the upper deciduous second molar occupies so much mesio-distal space that all of the upper teeth anterior to it are held in malocclusion.



Fig. 15.—Showing malocclusion caused by the too early loss of the lower deciduous second molar. The space should have been maintained by means of an appliance until the second bicuspid erupted.

developing permanent upper second molar is sufficient to move the first molar mesially. Cases should be observed at frequent intervals and appliances used when they are required. I have found a simple appliance consisting of two plain bands connected by a wire bar very efficient. This is cemented in place, and the wire can be lengthened by pinching if additional space is needed.

Some men, who have recognized that something ought to be done to reduce the mesio-distal space maintained by a deciduous molar, and who have not felt the extraction of a perfectly good tooth justifiable, have ground away the mesial

and distal marginal ridges of the tooth. (Fig. 16.) This will allow the crowns of the approximating teeth to move closer together, but the wide-spread roots of the deciduous molar will still keep the roots of the teeth apart and give them an abnormal inclination. It will also make the extraction of the deciduous molar a more complicated operation at a later time.

Proper operative procedures should be administered to preserve the normal mesio-distal width of deciduous molars in case of caries. Regarding abscessed deciduous molars, Black says: "Chronic abscesses from deciduous teeth will often heal, following proper pulp treatment and root filling. In cases in which these abscesses can not be cured, the teeth should be extracted. It should be remembered that absorption of the root of a deciduous tooth does not occur if there is a chronic abscess, the activity of the absorption cells being prevented by the presence of the suppurative focus." However, in cases where the pulp

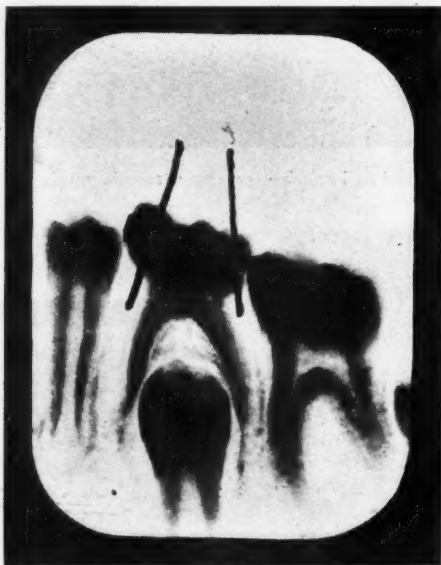


Fig. 16.—Indicates portions of tooth removed by grinding in order to reduce the mesio-distal width.

has been removed and the root canals filled, the absorption seems to proceed in a normal manner.

When the extraction of a deciduous molar is indicated, the operation should be carefully done to prevent injury to the developing bicuspid, which in most cases is located between the roots of the molar. In some cases, no doubt, bicuspids have been extracted unintentionally along with deciduous molars. The entire deciduous molar should be removed, including any small portions of the roots that may break during the operation, for frequently these fragments are not absorbed, and cause malocclusion by preventing normal proximal contact of teeth. When the extraction of a deciduous molar is indicated and there is any question as to the presence of a bicuspid to take its place, a radiograph is advisable.

In some mouths one or more of the bicuspids never develop. This fact is frequently indicated by the lack of occlusion of some of the deciduous molars,

that is, infra-occlusion, which would seem to indicate that in some cases the presence and development of the bicuspid are essential to the normal development of the alveolar process. Where infra-occlusion is noted, a radiograph should be obtained before making a diagnosis. (Figs. 17 and 18.)

In cases where a deciduous molar is retained in the arch and no bicuspid is present to replace it, a careful study of the occlusion should be made before determining the proper treatment.

I believe that the importance of the deciduous molars has been universally

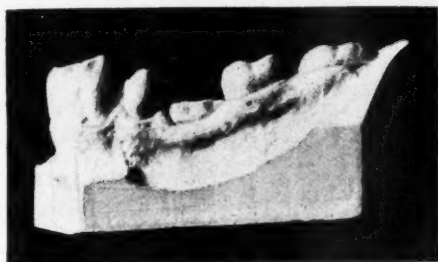


Fig. 17.—In this case no lower second bicuspid developed.

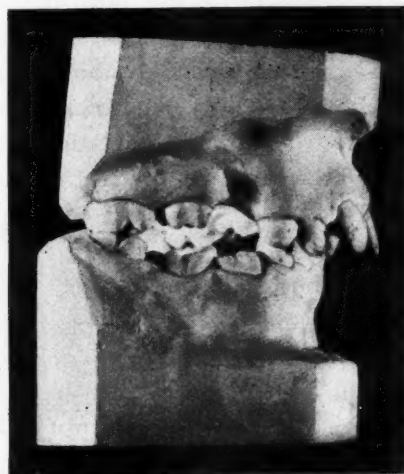


Fig. 18.—All of the bicuspid were absent in this case. Note the lack of occlusion of the deciduous molars.

overlooked or misunderstood, and that they exert more influence on the occlusion of all of the permanent teeth than do any other teeth. When they are moved, in correcting malocclusion, and too much absorption of their roots has not occurred, the bicuspid are usually moved along with them, owing to their intimate relationship, which is not true regarding other deciduous teeth. The deciduous molars, therefore, are directly responsible for the positions of the bicuspid; they also directly influence the positions of the permanent first molars, and in this way influence the positions of the second and third molars, and, as explained, they are responsible in many cases for the occlusion of the anterior teeth. Therefore, we should see that the deciduous molars are placed in normal occlusion, kept there until the proper time for their loss from the arches, and removed at that time.

A STUDY OF SOME FUNCTIONAL INEFFICIENCIES OF THE TEETH ASSOCIATED WITH OCCLUSAL ANOMALIES*

BY MILO HELLMAN, D.D.S., NEW YORK CITY.

GENERAL CONSIDERATIONS.

THE relationship between the teeth and the living organism is of so intimate a character that not only the odontologist but also the students of more remote sciences are beginning to emphasize its significance. When it is considered that the three most reliable sources of scientific evidence, paleontology, comparative anatomy and embryology are replete with records bearing upon the paramount importance of this relationship, it may be realized what extensive proportions the knowledge of the teeth is assuming.

Thus, in the discoveries of fossils ample evidence is obtained in the dental organs furnishing clues that point the way to a better understanding of the nature of those extinct animals whose remains are found in the more remote earth crusts, thereby giving valuable information regarding evolutionary incidents.

Comparative anatomy discloses the progress made in the course of evolution in the manifestation of the advantages gained by the animals exhibiting variously specialized dental organs, adapting them to the exigencies of the different kinds and character of existing foods and equipping them with weapons for combat.

Embryology, by its epitomized history of the development of the race, bears unmistakable evidence of the effects of hereditary, physiologic and pathologic influences as reflected upon the teeth during the development of the individual.

THE HUMAN DENTURE.

The normal human masticating apparatus was thoroughly studied and aptly described by such authorities as Mühlreiter,¹ Black,² Angle,³ and others. The advantages gained by, and benefits derived from, sound teeth in normal occlusion could in no instance be exaggerated. But although a vast amount of literature is devoted to the commendation of the normal dental apparatus, the profession in general either fails to grasp the weight of the arguments adduced or misunderstands or misinterprets the principles involved when their application is necessitated in conditions arising upon digressions from the normal. It is, therefore, intended in this essay to touch upon certain functional inefficiencies associated with the dental organs, emphasize their significance, point out their probable immediate origin, and, in some instances, their possible prevention.

THE FUNCTION OF MASTICATION.

The primary function of the teeth is the mastication of food. It necessarily follows that in order to have perfect function, there must be a thoroughly efficient organ to perform it. In other words, a normal adult denture, consisting of

*Read before the Harlem Dental Society, New York City, October, 1916.

¹Mühlreiter, E.: *Anatomie des Menschlichen Gebisses*, 1891.

²Black, G. V.: *Dental Anatomy*, 1902.

³Angle, E. H.: *Okklusions-Anomalies der Zähne*, 113.

thirty-two teeth, must be so constituted that each individual tooth is enabled to do its share of work in accordance with the law of "physiologic division of labor" in the proper performance of its function when chewing food. If a tooth fails to do its full share of work in the act of mastication either through absence or pathologic inability, the functional value of that denture is decreased not only to the extent of one thirty-secondth part of the normal human adult denture as is quoted by various authors, but a great deal more. Each individual tooth has a unique function; i. e., its function differs from that of any other tooth in the mouth; this, of course, depends upon its normal form, normal size, and normal position. In proportion to its deviation from these three fundamental conditions, it will individually affect functional efficiency. Furthermore as every tooth in each jaw is opposed by two approximating teeth in the other jaw, with the exception of the lower central incisor and upper third molar (see Fig. 1), if one is functionally disabled, it will also similarly involve its antagonists. It is conse-



Fig. 1.—Normal occlusion. (After Noyes.)

quently quite plain that although one tooth constitutes a thirty-secondth part of the adult human denture as far as the number is concerned, it represents a far greater quantity when its functional value is considered.

Moreover, as the absence of a tooth breaks up the continuity in the series of elevations and depressions in the grinding plane of the denture and destroys the mutual support derived by the proximating contact, it also tends to allow displacement or migration of the adjacent teeth, and thereby further decreases functional efficiency. A fair illustration of the functional disturbance of a denture that would undoubtedly have reached its normal development if nothing had interfered with the natural course of events is represented in Fig. 2. It may be seen that owing to the loss of the lower left first permanent molar, which was extracted at an early period in the development of the denture, the adjacent teeth approximate each other, almost entirely obliterating the space of the

extracted organ. Thus, a valuable developmental stimulus has been eliminated; the result, as may have been expected, can be seen by the failure of the forward growth of the alveolar process and teeth anterior to the extracted molar, they being in distal occlusion, and a forward and inward tilting of the teeth posterior to it. The vertical as well as the horizontal position of the teeth on that side is consequently abnormal. A better idea may be obtained by a comparison of the occlusion on this side with that on the undisturbed side (Fig. 3). The protrusion of the upper teeth in the anterior part of the denture may also be observed. The extent to which the median line has been disturbed is seen by

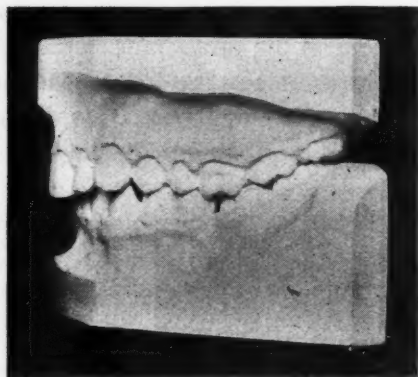


Fig. 2.—Case showing malocclusion caused by early loss of lower first permanent molar. Space is obliterated due to lack of forward growing of teeth and alveolar process anteriorly and forward tipping of molars posteriorly.

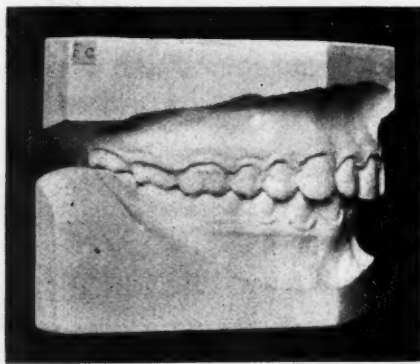


Fig. 3.—Same case as Fig. 2, showing normal occlusion on the side where no teeth were extracted.

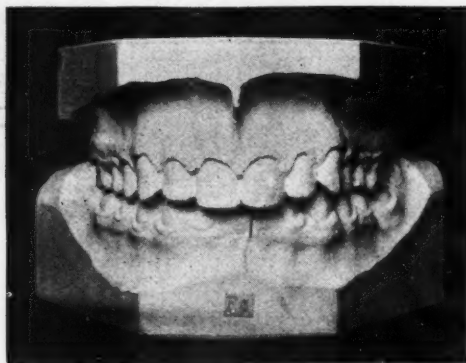


Fig. 4.—Front view of same case, showing disturbance of median line as indicated by vertical mark due to lack of forward growth of left side of the lower dental arch anteriorly to the extracted first lower molar.

the vertical mark (Fig. 4). So then, through the loss of one tooth in this instance normal development has been interfered with and the efficiency of two-thirds of the denture has been impaired. Beginning at the right canine region and proceeding toward the left and distally, all the teeth are in malocclusion. What is the moral of this case? Would it not strongly suggest that if the space left by the *presumably inevitable* extraction of the one tooth had been maintained by artificial means, this whole condition might have been prevented? It is undoubtedly much simpler, a great deal easier and more economical—at

least from the patient's viewpoint—to prevent the occurrence of such a disturbance than to create it and then necessitate the correction by orthodontic means.

That similar causes bring about like effects will be evident when the consideration of another case is resorted to. However, besides the disturbance of the teeth in their occlusal relations, interfering with the masticatory function, there were in this case also pathologic complications of the soft tissues. In Fig. 5 it will be observed that the lower left first permanent molar is missing. The conditions created on this side of the mouth are similar to those in Fig. 2.

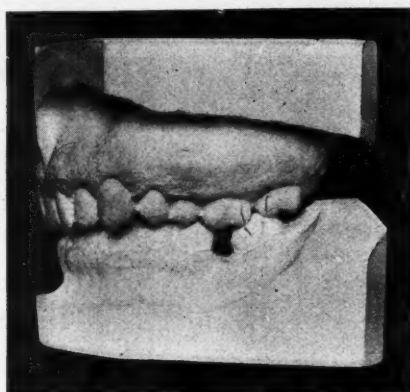


Fig. 5.—Left side view of similar case to that in Fig. 2 showing like effects.

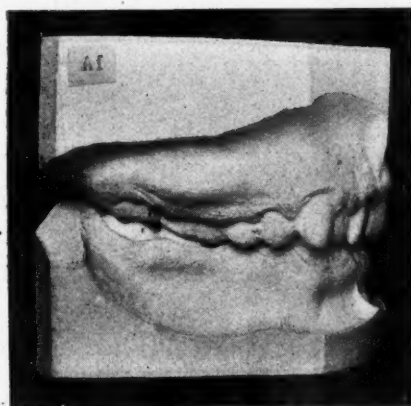


Fig. 6.—Right side view of case of Fig. 5, showing condition of upper first molar and its relation to the lower.

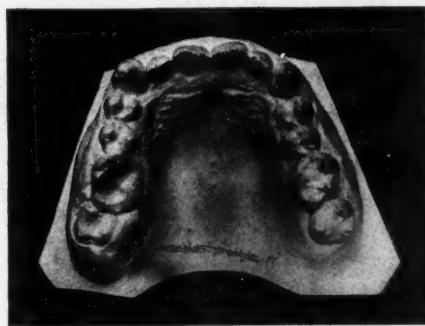


Fig. 7.—Occlusal view of the upper arch of case as Fig. 5, showing disturbance in the alignment of the teeth, condition of the right upper first molar and hypertrophy of the gum tissue in that region.

On the right side, however, of this denture (Fig. 6) it will be noticed that the upper first molar is broken down, and there are evidences of the dentist's interference. The result of this condition may be seen in the hypertrophied appearance of the gum tissues surrounding the first and second molars (Fig. 7). Owing probably to the pathological condition of the upper first molar itself, the function of mastication seems to have been preferably performed on the left side of the mouth. Meanwhile, the lack of function, coupled with the carious condition of the molar and its infected pulp increased the inflammation and hypertrophy of the soft tissue in that region to such an extent that the second upper

molar is almost entirely covered by the gum. Another instructive lesson taught by the condition of the gum tissue when the two sides of the dental arch are compared is that the functional side presents a generally clean and hygienic appearance of both the teeth and gums, while the afunctional side is found covered with deposits of mucus and detritus of foodstuffs which under normal conditions are removed by the massaging effect of the food gliding over these surfaces during the act of mastication, as well as by the normal functional activity of the epithelial layer covering the oral cavity.

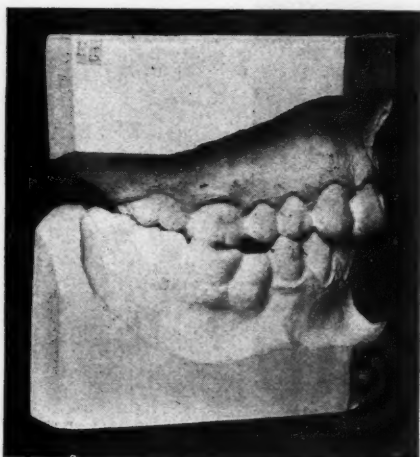


Fig. 8.—Right side view of case, showing missing upper right lateral incisor mal-shaped, lower first molar gold crown preventing the second premolar from its reaching the occlusal plane.

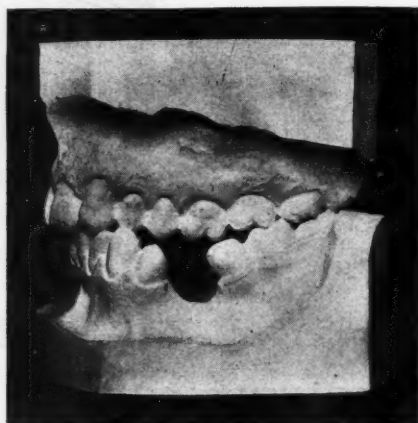


Fig. 9.—Left side of the same case, showing missing upper left lateral incisor, second premolar in proximity to the second molar, leaving space of first molar which was extracted intervening between the two premolars.



Fig. 10.—Occlusal view of lower dental arch of the same case, showing form of right lower first molar crown and its effect upon the adjacent teeth.

In this, as in the previous case, a great advantage would have been gained if the space created by the extraction of the lower left first permanent molar had been mechanically maintained; and, if the right upper first permanent molar would have been properly treated, the malocclusal condition could have been in a large measure, at least, averted and the functional disturbance prevented.

It is obvious, then, if the elimination of one tooth is liable to produce such marked occlusal disturbances, what may be the result of more extensive complications. In Figs. 8 and 9 is presented a denture, the functional value of

which is almost nil. If carefully examined it will be found that besides some developmental shortcomings, there are also certain peculiarities of growth, aggravated by inefficient dental operations. As it will be observed, this individual has had the misfortune of being deprived by nature of two dental organs. The upper lateral incisors are missing and their germs seem never to have been developed. Fig. 9 the lower left first molar was extracted when the patient was quite young, probably before the eruption of the second premolar, and the latter tooth has taken its position adjoining the second molar, leaving part of the space created by the loss of the first molar intervening between the two premolars. On the right side of the lower jaw (Fig. 8) the first permanent molar seems also to have been defective but owing to the corrective measures adopted by the dentist, the probable loss of that tooth was prevented. The manner in which this result was accomplished constitutes by no means a standard toward which the modern dentist would feel irresistibly attracted. What the end in view in that case may have been, in the dentist's mind, is certainly not clearly demonstrated by the result. Esthetically, the gold crown upon the molar would hardly be considered a model of beauty; functionally, the tooth is not only worthless, but also harmful. For, as may be seen in Figs. 8 and 10, the tooth is reduced in its anatomical dimensions, it has the form of anything but that of a lower molar, serves as a splendid medium for the displacement of its upper antagonist, and prevents the second premolar reaching the normal occlusal plane. As was said above, the primary function of a tooth is to masticate food, and in order to be able to perform this function, it must be normal in its anatomical makeup, and occupy the position allotted to it by nature. If our efforts exerted in the saving of teeth fall short in either of these demands, our endeavors have been useless and our mission has not been fulfilled.

Another important consideration in conjunction with this problem that is worthy of our attention is the phenomenon of equilibrium existing between the activity of muscular force and the physical resistance of the teeth. In the normal masticating apparatus the force exerted by the muscles of mastication must be counterbalanced by the resistance of the teeth, periodontal membrane, and alveolar process during functional activity. If the muscular force remains normal and the denture, through mutilation or otherwise, is prevented from rendering its required resistance, the equilibrium is disturbed and the overburdened teeth and their investing tissues greatly weakened. This may give expression in extensive wear of the tooth structure, if it be poorly calcified, or affect the periodontal membrane and alveolar process, if the tooth itself is sufficiently strong to withstand the force of the muscular pressure and the wear of the triturated substance. If, on the other hand, the muscles of mastication adapt themselves to the weakened condition of the dental organs, they in turn will gradually lose their normal consistency and may eventually atrophy.

Normal development in general is dependent upon the correlated activity of many parts of the organism. If in any part stimuli and responses are lacking, the development of that part is arrested or inhibited. The stimuli may be physical, chemical or nutritional. In the examples cited it is apparent how, by the elimination of one member of the dental series, the efficiency of the entire

organ of mastication may be disturbed. However, the nature of the disturbance is in a large measure determined by the nature and state of the individual at the time of its occurrence and by the character of the disturbing factor. Thus similar causes may give rise to considerably more complicated conditions, while like results may be due to less significant causes if manifested at an earlier period of life. For instance, a carious cavity on the proximal side of a tooth—if it happens to belong to the deciduous series—may produce a decrease in the size of the entire dental arch as well as a change in its form.

The proportion which disturbances of this character may assume as a result of decayed teeth will be evident from the models of a case illustrated in Fig. 11. The child was six years old when the impressions were taken. Notice the extent of the ravages of caries in this mouth, and the effect this condition produced upon occlusion (Fig. 12). Every deciduous tooth still present is irreparably disintegrated, while six of them had to be extracted. Observe furthermore, the functional value of this masticatory apparatus. Is there any

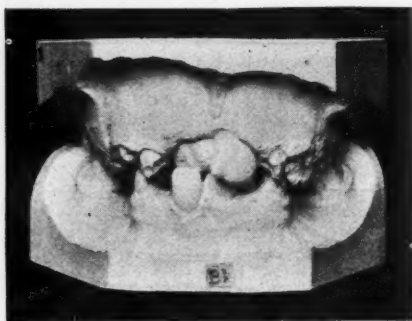


Fig. 11.—Front view of case, showing malocclusion due to extreme disintegration of deciduous teeth.

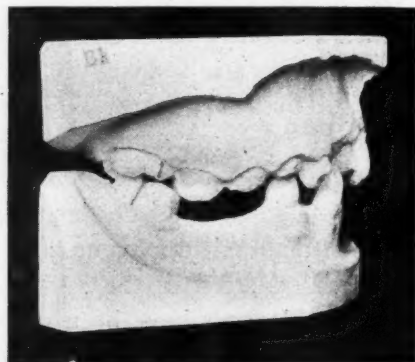


Fig. 12.—Side view of the same case, showing effect of decay upon the efficiency of the organ of mastication.

possibility of any solid food being masticated by such a denture? And were it possible, think of the number of bacteria lodged in those carious crevices that would be mingled with the food and carried into the alimentary canal.

The carelessness of a physician who administered medicaments deleterious to tooth structure without the necessary precautionary measures, and the ignorance of the parents in not applying to the dentist for the prompt and proper care of the teeth, are entirely to blame for the dilapidated condition of this child's mouth.

Another case that may be of interest in this connection is portrayed by the model Fig. 13. It represents the denture of a child five years of age. The only decayed teeth noticeable are the lower second molars, which are almost entirely broken down (Fig. 13A). Owing to the extreme fear of this child for the dentist and probably lack of the proper psychic influence of the latter, the teeth were allowed to go by default. I am aware that it was impossible to control this child in the dental chair. It must, however, not be omitted to state that there were very little difficulties encountered in the operation of obtaining impressions, from which these models were made. What happened to this child's mouth

may be appreciated on examination of the models (Figs. 14, 14A, and 14B) prepared from impressions obtained two years later. That such a masticatory apparatus is entirely devoid of function, will be readily admitted. The conclusion

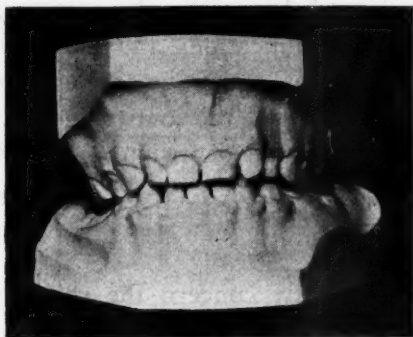


Fig. 13.—Front view of deciduous dentition, showing extremely decayed lower second deciduous molars. Also a left upper supernumerary lateral incisor.

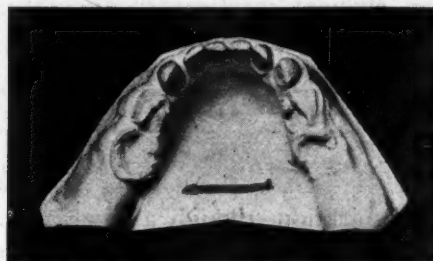


Fig. 13A.—Occlusal view of lower dental arch of the same case as Fig. 13, showing the condition of the decayed second deciduous molars.

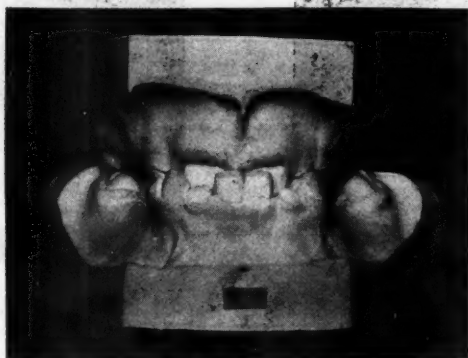


Fig. 14.—Front view of the case of Fig. 13, showing effect upon occlusion two years later.

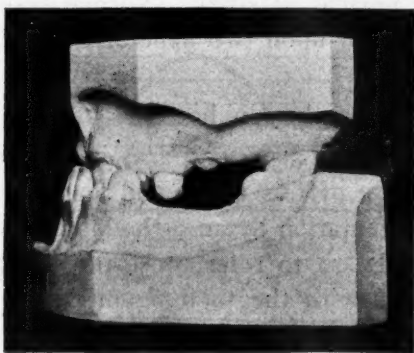


Fig. 14A.—Left side view of the same case, showing condition and relation of the teeth from the lateral aspect.

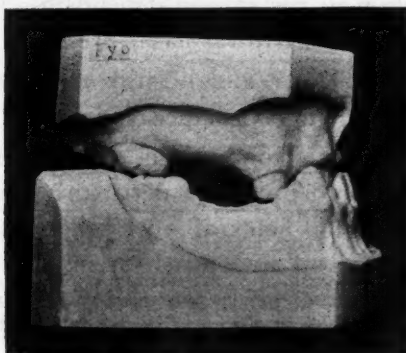


Fig. 14B.—Right side view of the same case, giving another aspect of malocclusal condition.

one must inadvertently arrive at is that in order to have a thoroughly efficient masticatory apparatus, it is imperative to have not only the full complement of teeth in normal occlusion, but also each tooth must represent morphological

perfection, anatomical completeness, and physiological potency. Or, as Angle formulates it: "The shapes of the cusps, crowns and roots, even the very structural material of the teeth and their attachments are all designed for the purpose of making occlusion the one grand object, in order that they may best serve the chief purpose for which they were intended, namely, the cutting and grinding of food." All human beings bring the qualifications and possibilities of an efficient masticatory apparatus with them, but owing to the numerous disturbances the individual is subject to it devolves upon the knowledge of the parents, the advice of the physician, and the skill of the dentist to make them realities.

THE FUNCTION OF RESPIRATION.

Respiration, though a topic that would apparently concern the rhinologist exclusively, is, nevertheless, of no little interest to the dentist and to the orthodontist. For, just as the highest efficiency in the function of mastication is at-

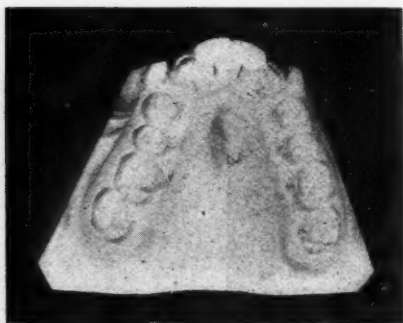


Fig. 15.—Occlusal view of upper dental arch before treatment, showing extreme narrow palate in the premolar and first molar region and lack of room for the alignment of the canine teeth.

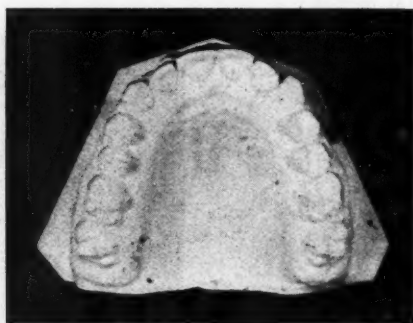


Fig. 15A.—Occlusal view after treatment of the same case as Fig. 15, showing enormous increase in width of the dental arch and palate, sufficient room having been made for the accommodation of the canine teeth.

tained through the normal activity of the teeth, so also is the perfection of the function of respiration dependent upon their normal passivity. Normal respiration, that is, natural nasal breathing, is dependent upon two general conditions:

1. A clear and healthy nasal tract.
2. Normally shaped jaw bones and dental arches in harmonious relation.

The first condition is entirely rhinological in its aspect; and as its consideration would involve a departure from the scope of this paper and lead us into other special fields of work where the best presentation by an orthodontist might prove but an amateurish attempt, it is deemed best to refer those interested to authoritative works on rhinology and proceed with the topic from the dental viewpoint.

With regard to the second condition we may divide the disturbances into the following types:

A. Those due to teratological or deformed conditions of certain parts of the jaws, such as the alveolar process of either jaw bone, or the palate process of the upper, and

B. Those due to well-shaped jaws but disharmonious in relation to each

other, such as Class II and Class III (Angle) cases of malocclusion where the dental arch formation may be quite right, but the teeth not in normal occlusion.

In the teratologic type there are cases that present a deformity in certain portions of the upper jaw, while the lower jaw may be quite well formed;

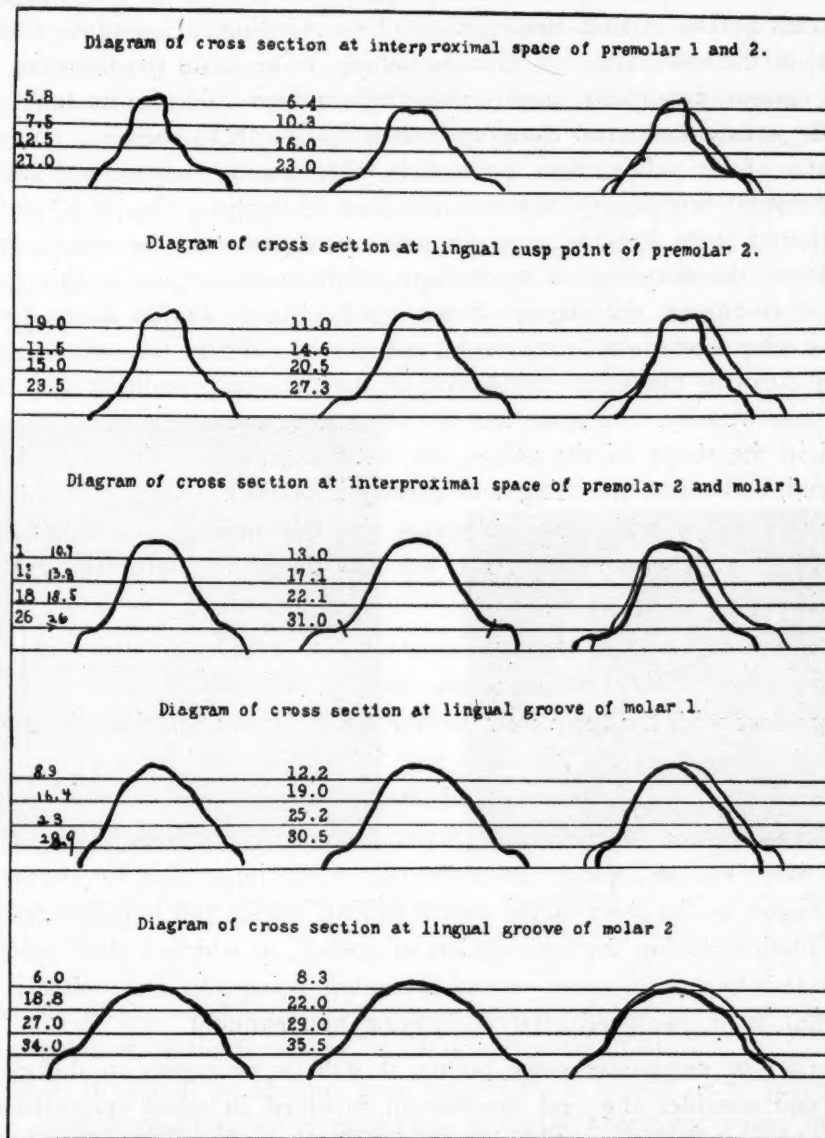


Fig. 16.—Diagrams of case of Figs. 15 and 15A to illustrate the change in form of the palate during orthodontic treatment. First column presents tracings of sections made from impressions of the palate before treatment; second column presents sections of impressions after treatment; and last column, the composite figures of the former two columns. The numbers give the measurements in millimeters of the various points where the lines of the diagrams are intersected by the horizontal lines. The composite figures give a graphic presentation of the change in form of the palate before and after treatment.

and others again may present just the reverse condition; i. e., the upper jaw may apparently be in good form and the lower deviate considerably. The deformities in the upper jaw are mainly limited to the hard palate. The vault of the palate is usually narrow and high; the lateral halves of the bony plates constituting it, instead of describing a gradual curve, unite in the median line

in such a manner as to form an acute angle, the so-called V-shaped vault. If it be remembered that the tissues constituting the hard palate are but thin plates of bone, forming the roof of the mouth by their under surface and the floor of the nose by their upper surface, it will be apparent in what manner the nasal chamber will be affected by such a deformity of the roof of the mouth. Fig. 15 illustrates a case of such description. Two rhinological operations were unsuccessful in the restoration of nasal breathing. The nasal tissues were so sensitive to various disturbing factors that the slightest cold, for instance, would occlude the constricted nasal chamber. As it is difficult to convey a correct idea of the form of the palate from the models, representing the occlusal surface of the same upper dental arch before and after treatment (Fig. 15A), diagrams were prepared from sections of an impression to illustrate the exact condition. Fig. 16 shows the diagrams of impressions of the palate region of this case, and in order to emphasize the degree of this malformation, similar diagrams of the same case after treatment were made and placed side by side as well as in a composite form to facilitate comparison of the previous condition and the subsequent improvement. It must not be omitted to state that with the change produced in the shape of the palate, the extreme susceptibility to "colds" also disappeared, and nasal breathing was greatly improved. Thus it is shown that in this case nasal breathing was defective not only through pathological conditions existing in the respiratory tract, but also through a deformity correctable by orthodontic measures.

In the lower jaw these deformities are not as frequent. But when they do occur, they present disturbances of an entirely different character. Thus, the alveolar process with the teeth may assume such forms as to describe any figure but that of a dental arch. The teeth may be so malposed as to encroach upon the space allotted for the tongue and the latter prevented from assuming its normal position when the mouth is closed. Fig. 17 illustrates a case in which the lower jaw (Fig. 18) was so deformed that it was impossible for the patient to rest his tongue on the floor of the mouth during repose and handicapped him in its manipulation during the articulation of speech, to which I shall refer later; the distance between the lower second premolars being 13.7 mm. while it should be 31.7 mm. as it measured after completion of treatment.

In order to emphasize some points, it will be necessary to digress for a moment and consider the oral mechanism involved in nasal respiration. "In the normal breather the mandible is raised and the teeth brought into occlusion, and as the act of swallowing is performed, the tongue expresses the air from between itself and the roof of the mouth, the lips and cheeks are sucked down upon the teeth, the lower lip binding over the lower edge of the upper incisors [and canines] the soft palate is raised and then allowed to drop upon the dorsum of the tongue, shutting off the oral cavity. The teeth then just drop apart from occlusion, and the mandible is suspended by atmospheric pressure and the muscles of the cheeks and lips are in repose" (Stanton). It is, therefore, clear that when the mouth is closed, the tongue fills the entire oral cavity between the dental arches, while the lips are in contact with the teeth externally, so to speak. The

tongue, lips and cheeks are in a relaxed condition, held in place by muscular tonicity and atmospheric pressure.

If the last two cases be recalled, it will be obvious how impossible it would be to force the tongue against the roof of the mouth in the former, and to rest it on the floor of the mouth in the latter. And where there is no provision for the repose of the soft tissues surrounding the dental arches during nasal breathing, as in the above cited cases, the mouth will not stay closed without special effort. That effort may be exerted when the individual is conscious of it, but the moment consciousness is lost, as during sleep, the tissues relax, the mouth opens, and respiration is changed from nasal to oral.

While in type *A* form of disturbance, the nasal passage is encroached upon by the deformity of the hard palate and the tongue is deprived of its room either by the encroachment of the deformed palate or malposed teeth and deformed alveolar process, in the second form, type *B* disturbance, nasal breathing is interfered with by the inability of the lips to assume their normal position mainly

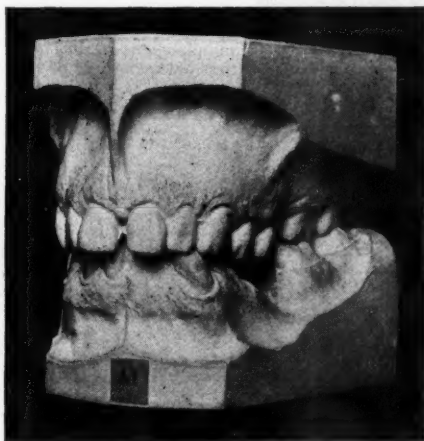


Fig. 17.—Case of malocclusion in which lateral sides of the lower dental arch was so constructed as to prevent tongue from assuming its normal position.

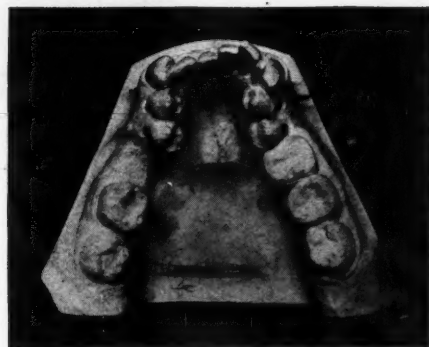


Fig. 18.—Occlusal view of the same case as Fig. 17, showing extreme narrowness of premolar region, interfering with the resting of the tongue during respiration and its manipulation during speech.

through the effect of disharmonious relationship of the jaws and the consequent malposition of the teeth; as, in Class II and III (Angle).

In Fig. 19 it will be obvious how impossible it would be to place the lips in their normal position, as is necessary in nasal breathing when the mouth is closed. As a result of this condition the lower lip instead of resting upon the incisal third of the labial surface of the upper anterior teeth, giving an expression as shown in Fig. 20, it assumes a position between the lower and upper anterior teeth, just filling in the gap created by the malocclusion (Fig. 21). The upper front teeth are grasped between the upper and lower lip, giving not only an unfavorable expression to the face, but also aggravating the occlusal condition and interfering with respiration; for as this position can not be maintained indefinitely, due to the unnatural muscular tension in the effort exerted in bridging the gap between the upper and lower teeth, the lips drop apart when the mind is diverted from them, and mouth breathing is the result.

Again, when the malocclusion is of a reverse character, as in Class III, Fig. 22, the normal relationship of the lips is again interfered with and similar conditions, but of a reverse order, are brought about, as in the cases cited. In this instance it must be mentioned that mouth breathing, apart from nasal and nasopharyngeal disturbances, was due not to the malrelation of the jaws alone, but

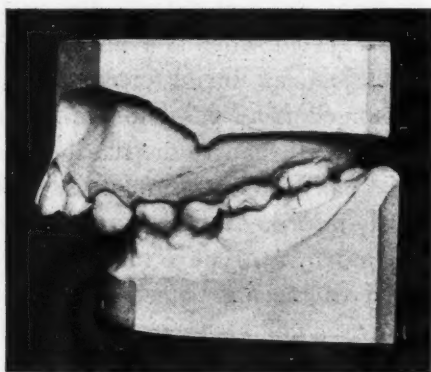


Fig. 19.—Side view of case of malocclusion, showing how the abnormal position of the teeth prevents the lips from assuming their normal position during respiration and the impossibility of bringing the incisors into correct position as is necessary in the enunciation of the sounds of s, z, sh, etc.



Fig. 20.—Facial expression of case presented in Fig. 19 after successful orthodontic treatment, showing correct position of the lips during normal breathing.



Fig. 21.—Facial expression of the same case as Fig. 20 before orthodontic treatment, showing abnormal position of the lips.

also to the unusually large tongue and underdeveloped upper jaw. It may readily be seen that an enlarged tongue could hardly be adjusted against a palate of the size of Fig. 23, which will be appreciated when the subsequent size and form of the same dental arch after treatment is observed in Fig. 24.

It can thus far be safely concluded that, as the process of decay may so

impair the teeth individually as to render them incapable of proper mastication, so certain forms of malocclusion will interfere not only with efficient mastication, but also with normal respiration.

THE RELATION OF THE TEETH TO THE FUNCTION OF SPEECH.

The obvious dependence of articulate speech upon the dental organs is at once evident when a person with missing upper incisors endeavors to pronounce any words containing such sounds as are represented by the letters *f*, *v*, *s*, *z*, *j*,

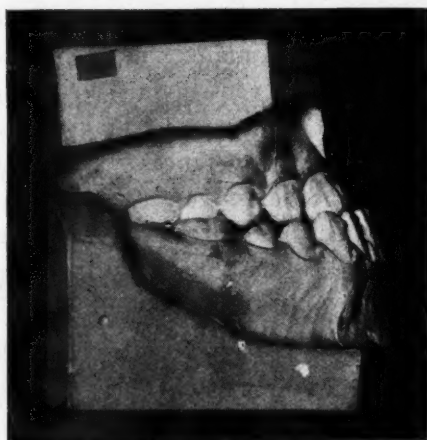


Fig. 22.—Side view of a Class III (Angle) case of malocclusion, showing condition which prevents the lips from proper apposition during nasal breathing and interfering with correct enunciation in the articulation of speech.



Fig. 23.—Palatal view of the same case of Fig. 22, showing diminished dental arch, due to lack of space for the right upper canine, and consequent difficulty of apposition of tongue during nasal breathing.



Fig. 24.—Palatal view of the same case as Fig. 23 after treatment, showing change in form and size of dental arch.

sh, *ch*. Thus it is a well recognized fact that in the old people with edentulous mouths speech becomes indistinct owing to the defective enunciation of these sounds. Actors have long ago recognized these deficiencies, and when impersonating the aged will imitate the manner in which these sounds are uttered. For instance, the sound of the letter *f* will be produced by bringing the upper and lower lips together by the edentulous person and forcing the air out between them, while the individual possessing the necessary teeth will express that sound by placing the upper border of the lower lip against the incisal edge

of the upper incisors. Also in children it is generally known to be a natural course of events for these sounds to become defective during the period intervening from the shedding of the deciduous incisor teeth to the eruption of their permanent successors. However, between the extremes of the correct enunciation in the individual with the normal denture and the completely defective speech in the one with the edentulous mouth, there may be found a continuous gradation of defects in the production of such sounds that vary from the least recognizable to the most marked. Of course, in resourceful man, particular effort and careful exercise may correct these faults by special training. Thus we have ventriloquists who can make themselves quite well understood by the manipulation of the tongue in such a manner as to pronounce every word without the use of the lips. But while ventriloquists can speak intelligibly by the use of special artificial means, it is in a good many instances a great effort to speak correctly under ordinary circumstances when certain parts constituting the mechanism of speech become defective. So we may have a disturbance of speech known as *cluttering*, when the desire to speak exceeds the ability to do so; or *stuttering*, when owing to some nervous disturbances the tongue or lips can not be finely controlled.

But even with the nervous and muscular elements in the best of conditions the articulation of speech may be affected when the teeth are in malocclusion. For instance, in the correct articulation of all the vowels it is first of all necessary for the tongue to assume a position in the floor of the mouth and then by changing the form of its dorsum and the shape of the aperture between the lips the various sounds are pronounced; as *a, o, u, e, i*. If Fig. 18 be examined again, it will be evident how impossible it would be to accomplish this. Under ordinary conditions it would require a distance of about 30 mm. at least between the lower second premolars to accommodate a normal adult tongue on the floor of the mouth in that region, while in this case the teeth were only 13.7 mm. apart. As this patient is a young lawyer, it may be evident how handicapped he was in the discharge of his duties.

Of the consonants the sounds of *s, sh, z, f* and *v* will be mentioned. Thus for the sound of *s* the incisors of both the upper and lower jaw are brought into an edge to edge position, and the tip of the tongue is placed behind and below the lower incisor teeth. And for the sound of *sh* the same position of the incisors is maintained, while the position of the tip of the tongue is changed from the previous one to that behind and above the upper incisors, in the region of the first palatine rugæ. While for the sound of *z*, the tip of the tongue is moved slightly forward and the voice is added to the current of air. If we now examine Fig. 19, we may see how difficult it would be to assume those positions with the teeth in that form of malocclusion. Also the sound of *f* or *v* would be difficult of proper articulation, in such case, since the lower lip inadvertently comes in contact with the lingual surface of the upper incisors instead of the incisal edge. But while in this case there are only difficulties encountered in such effort, there are cases where there is no possibility at all to accomplish it. Fig. 22 represents one form where it is impossible to bring the incisors edge to edge, for the mandible can under no circumstances be retracted to accomplish

it. Figs. 25 and 26 present another case where the position of the teeth is such as to prevent absolutely the normal production of the *s*, *z*, or *sh* sounds. The best that could be done in this instance by the patient was to produce a lisping sound instead, which was accomplished by substituting the tongue for the lower incisors; i. e., placing the tip of the tongue against the cutting edges of the upper incisors. The lisping sound may be very "cute" when prevalent in children, but when it becomes settled in the form of an acquired habit, it becomes a serious handicap to the adult. It is then extremely difficult to overcome despite the correction of the occlusal disturbance and remains a menace to the permanency of the orthodontic result.

CONCLUSION.

In closing it may not be amiss to emphasize the following points:

1. That the efficiency of a denture is dependent not only upon "the full complement of teeth in normal occlusion," but also upon each tooth being com-

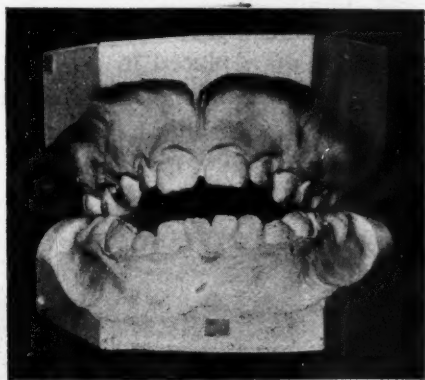


Fig. 25.—Front view of open bite case, showing impossibility of expressing correctly the sounds of *s*, *z*, etc.

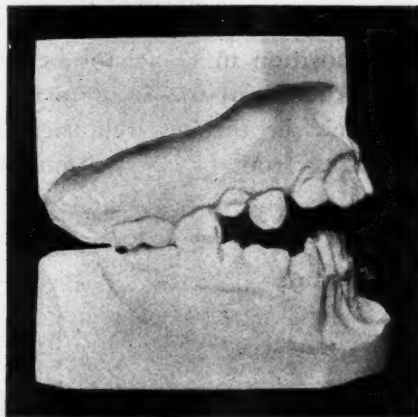


Fig. 26.—Side view of the same case as Fig. 25, illustrating more clearly the inability of bringing together the incisor teeth as is necessary in the articulation of speech.

plete in its form, integral in its constituent parts, and secure in its attachments to the supporting structures.

2. That with the loss of one unit of a denture the functional efficiency is reduced to a vastly greater extent than that represented by the relative numerical proportion of the teeth in that denture.

3. That the teeth, though vitally concerned in the mastication of food, constitute at the same time important adjuncts in the perfection of the functions of respiration and of speech.

4. That with every digression from the normal in occlusion affecting the process of mastication, there is also a corresponding deviation from the normal in respiration and speech.

5. That in proportion as these fundamental facts will be fully recognized and the lesson involved appreciated, we may learn to heed more the warnings in every act of our professional duties, urging us on to the best efforts, with the punishment in the shame of failure and compensation in the glory of success.

FACIAL IMPRESSIONS AND CASTS

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PART II.—THE FRONT FACIAL CAST.

PART I of this article on facial casts and impressions treated of the methods of making facial impressions in general, and outlined in detail the construction of only the profile cast. The general principles of the formation of the front facial cast are also given in the preceding article, for the applying of the plaster, and the pouring and finishing of the model are very similar in the two phases of the work, front and profile. It is unnecessary to repeat the advice to the operator as to the care of the patient in the work, hence, only the operation itself will be outlined with detailed description of the work only where the construction differs from that of the profile impression.

In the making of either of these casts the patient should relax in a comfortable position in the chair, or, if convenient, should recline on a table. In the construction of the front facial cast, if the patient is placed in a chair, the head should be thrown well back, though in a comfortable position, in order that the full front facial view may be within easy reach of the operator.

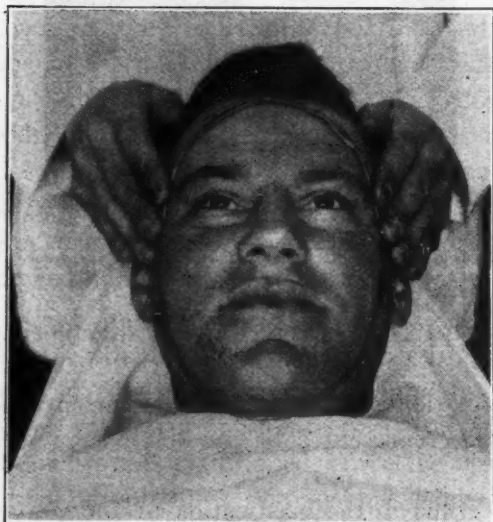


Fig. 7.

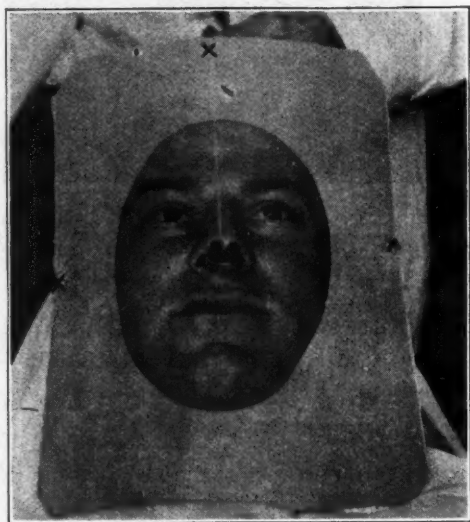


Fig. 8.

The pasteboard barrier is again brought into use in making this cast as in the other, only in this case the piece of round lead wire which is pressed against the face so as to conform to the features, includes more than the profile, and is placed in such a position that it outlines that part of the face that is to be shown in the finished cast (Fig. 7). This wire should be removed very carefully to prevent any change in the form. The shaped wire is then placed on a piece of pasteboard; with a pencil a mark is made around the wire, outlining it, and then a sharp knife is used to cut along the line and remove the

inner part. The remaining frame is fitted to the face of the patient to serve as an obstruction to spreading plaster (Fig. 8). This barrier will not stay in place as easily as the pasteboard form used in the profile cast, and therefore must be fastened on securely. A small hole punched about midway on either side of the frame enables a string to be tied around the head to hold the pasteboard form closely to the face.

Of course, it is necessary to furnish some way for the patient to breathe during the operation, and for this purpose two small rubber tubes may be utilized. These tubes are soft enough to prevent injury and yet defy the plaster. Care must be exercised that the breathing apparatus is not too large or it will cause the nostrils to bulge, yet at the same time, tubes too small might make the breathing difficult. These tubes must be fastened in position, which is best when they form an obtuse angle with the nose. To hold them at this angle, a

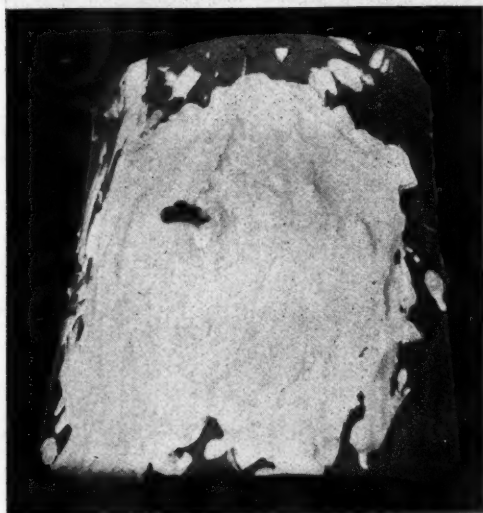


Fig. 9.

loop of string draws them together and then ties through a hole at the top of the board (Fig. 8). The reason that the adjustment of the tubes is important is that they may be at the most beneficial angle to the comfort of the patient, and at the same time may enable the operator to work the plaster around the nostrils without interfering with the breathing device.

After the frame is in place on the head, one of the first things to be done is to cover the face with vaseline, as is described in the preceding article on the profile cast. When this is done, the tubes are thoroughly greased, placed in the nostrils and adjusted, and the face is in readiness for the plaster coating. Before this is spread on, the patient had better be given a paper and pencil that he may write a message in case of any difficulty in breathing or any other trouble. A mix of plaster is made in a large bowl, and with a spatula, is carefully spread over the features. Enough plaster must be used in this first mix to cover the entire facial surface to be included in the cast, for if a second batch must be used to piece out the first, a seam showing the joining is the result. The coating should begin at the nose, working down to the mouth and chin and

then back up to the eyes, if these are to be included in the impression. When the first mix has completely covered the face, a second is put on to strengthen the cast (Fig. 9).

When the plaster has thoroughly hardened, it may be removed by gently working the impression up and down and then crosswise in order to get it well loosened. Before raising it entirely, it should be lifted carefully at one side to see that the eyebrows or eyelashes have not become entangled with the plaster while it is still wet. If such is the case, a small thin instrument passed between the face and the plaster will readily loosen the impression.

When the impression is dry, and the coat of shellac is put on and dried also, the model should be retouched with water and plaster to remove air bubbles and remedy any other blemishes. If this is done, after the impression



Fig. 10.

is dry, a second varnishing of shellac should be applied, and later, a thin covering of sandarac. The cast is now ready to be poured and the plaster can be worked well down into the tiny crevices by the use of a small camel's hair brush. If, when entirely dry, the original plaster mass is marked off for separation (Fig. 4, Part I) and block by block the sections are cut away, the almost completed cast may be removed from the mold (Fig. 10). A plaster knife used on the edges and surface will render the features clear and intact, while a final retouching with plaster and water will remove any surface scars, giving a smooth and finished appearance. Then after corks have been inserted in the back of the cast (Fig. 6, Part I) to provide a means of suspension by wires, the finished product remains.

(To be continued.)

RODGERS' TRIANGULAR CHART FOR TRIMMING DENTAL PLASTER MODELS

BY FRANK C. RODGERS, D.D.S., ST. LOUIS, MO.

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PLASTER models that are intended to be used for display or record should be carefully finished, since the appearance of a model is usually an index to the skill of the operator, and the time spent in doing this work carefully is not wasted.

The following rules should be observed for finishing the art portion of the model:

1. Horizontal plane: When the models are placed on a level surface the upper plane should be parallel with the lower, and not tilted in any direction.

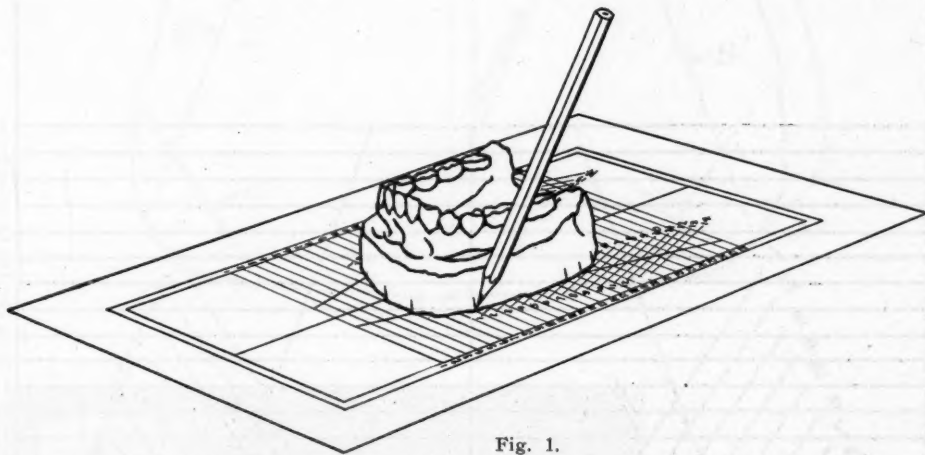


Fig. 1.

2. The walls should be perpendicular, and form right angles to the top and bottom of the model when articulated.

3. All the angles should be equally distant from the center line.

4. The upper model should be as wide as the lower. (Models finished according to the chart are standardized, and will present an artistic and mechanically perfect balance.)

In Fig. 1 a model is shown ready for marking. It should be placed on the chart so that the center line will pass through the center of the model, establishing the medium line. (Fig. 2 illustrates the chart.)

The heavy lines shown in Fig. 3 represent the outline of the finished model. The lines *B* are first located by placing the model on the chart, so that the triangular lines will pass just beyond the buccal surface of the teeth. This point, where the line passes in front and emerges in the rear of the model, is indicated by a pencil mark, and forms a junction with lines 5 and 18.

The anterior line *A* is established by locating the line which will pass slightly beyond the labial surface of the anterior teeth, as shown in illustration. This line forms a junction with line 8 on the chart, and is indicated by pencil mark.

Posterior line *C* is located by noting the line that passes just beyond the

distal surface of the molar. This is indicated by line 20. The posterior angles *D* are located by the line passing distal to the proper distance to the posterior tooth, indicated on the chart at 16. The anterior line on the model is drawn by placing a ruler opposite the pencil marks. The excess plaster is trimmed away in the usual manner with a plane, then finished with a file.

The anterior portion of the lower model is generally rounded off, as shown by dotted line *A*. The circle is found by placing the points of a divider at the angles *A*, then changing the points to the center line and describing the arc of a circle, as indicated by the arrow at *A* and the radius line.

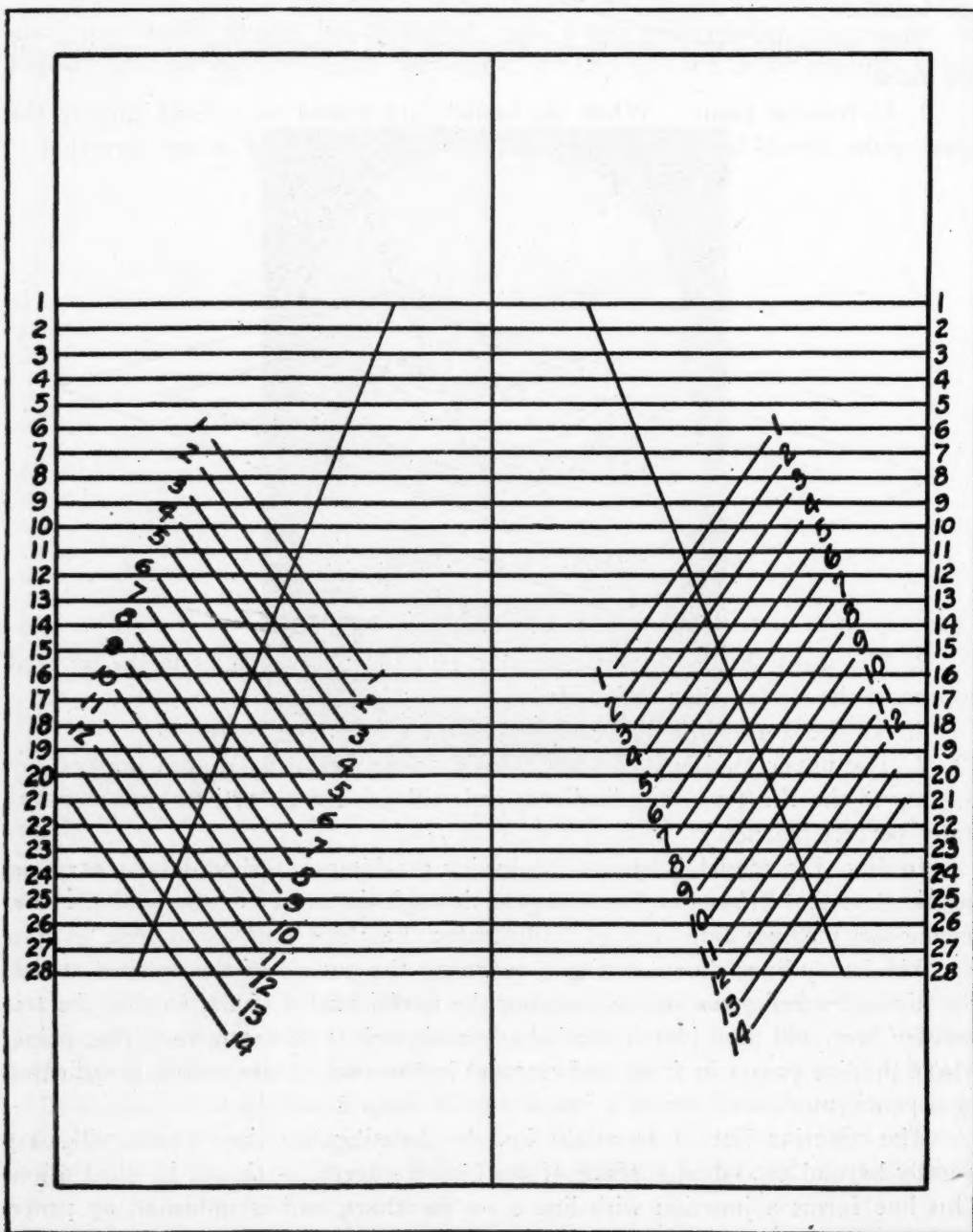


Fig. 2.

After one or two trials, the operation of trimming dental models will be found so simple that the average office girl will be able to do this work just as perfectly as an experienced operator, and in one-third of the time.

Figs. 4 and 5 show models that are trimmed according to the chart mentioned above.

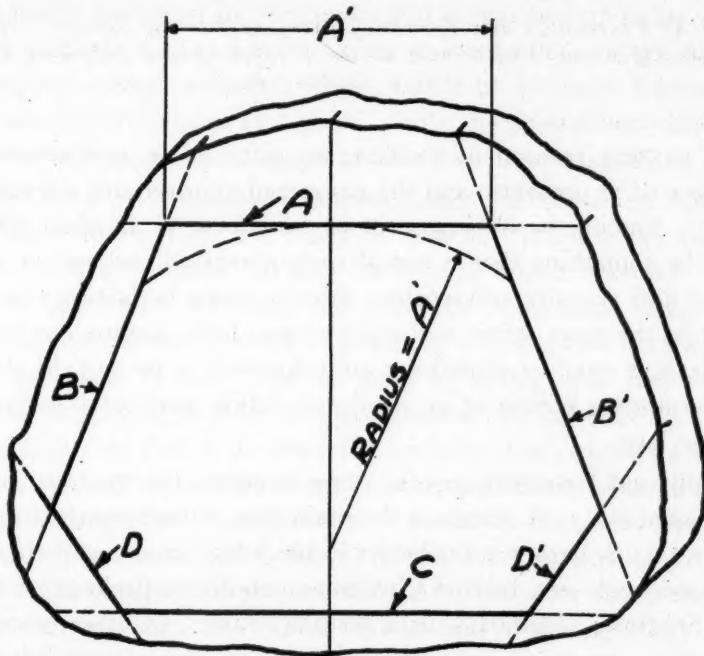


Fig. 3.

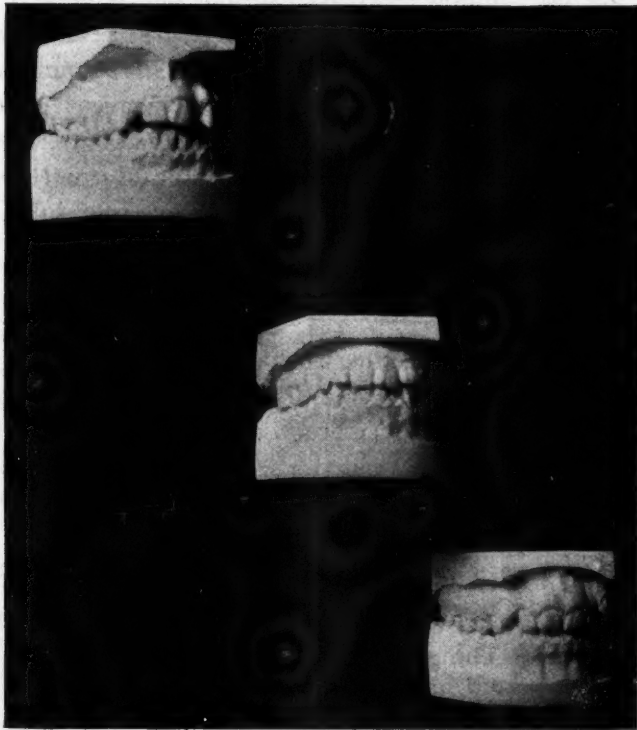


Fig. 4.

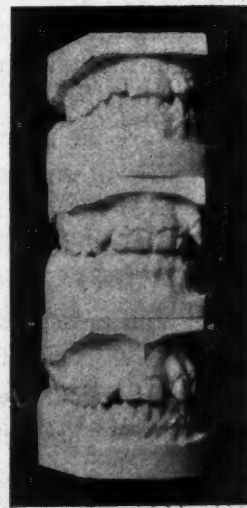


Fig. 5.

ORTHODONTIC HABIT-CULTURE AT HOME: AN IDEAL GIFT TO YOUR CHILDREN*

BY GEORGE VAN NESS DEARBORN, M.D., PH.D.,

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Children, Boston; etc.*

IN the now passing fashion of exchanging gifts, often is there real difficulty in the choice of fit presents; and the pampered children are sometimes hardest of all to "fit." Among the obvious criteria of fitness of an ideal gift are these: First, it must be something that is not already possessed; second, it must be continually useful and actually serviceable; third, it must be lasting; fourth, it must be a reminder of the giver, often and everywhere; fifth, it must not be an extravagance; and sixth, it must be something not otherwise to be had, in all probability. My present intimating notion of an ideal gift fulfills each of these requirements, as you will see later.

A generally and frequently useful thing is better for the most part than one of only occasional use: A watch, a fountain pen, a tape-measure, a jack-knife, a road-map or a work-basket is far better in the long run as a gift than are objects of only rare use, such as a box of Christmas candles, a package of fire-works, a ticket to the Stadium, a compass, or a birthday-cake. In other words, an object is desirable also somewhat in proportion to its general usefulness and applicability.

Were not almost every one fully supplied already, so that one seldom feels the lack, we should realize furthermore that rules and measures are the most useful of all objects to very many of us. Foot-rules, yard-sticks, tape-measures, scales of all sorts, watches, thermometers, gill-cups in the kitchen, gas meters, coins, bank-notes, quart-measures, clocks, and barometers. But even more useful yet than these, we should find were we without them, would be *abstract rules*, principles, and guides, such as the multiplication table, the square-root rule, the metric system, the laws of business, recipes for mince pie, and for bread, the ten commandments, etiquette rules, the laws of hygiene, and the Constitution of the United States.

Ideas are the most influential things in all the world, and especially abstract rules of life, of successful, happy living, applicable always each day and hour, in every field of life, in Roxbury or in the Kameroons, today and on the last great day of all, and to every mother's son or daughter of us. Glance back over what your parents actually have given you and you will be glad to admit that the rules and measures, especially the abstract ones (because most generally applicable) have been of exceeding value to you, more so than any objects have ever been, made of steel, of glass, or gold. Neither your parents nor you may realize this, but assuredly it is true. Things are not less real, and certainly far

*Remarks made, for the most part, the Sunday afternoon before Christmas, 1915, to parents and nurses at the Forsyth Dental Infirmary for Children, Boston.

more useful, because they are abstract, and to be handled with mind rather than with muscle.

The Wisdom of Life above all other things we know is the most precious heritage that civilization and our humanity itself have given us as birthrights. Practical life-psychology especially is part of the coming ideal home-education which is so much discussed in our books and magazines of today. Indisputably mothers and fathers (as has been so often pointed out) are the natural elementary teachers of young children. How much of primary life-importance the mother teaches her little boys and girls! Only the motherless children feel, and show when they grow up, how much of life they have missed.

We often hear of "feminine intuition," and it is one more respect in which women far excel men; there are many of course. Women are fully the equals of men, but built differently in body and mind for a reason. They are not "equal" in the mathematical sense, but are fully equivalent, always. The more we learn about this master-mystery of creation, woman, the surer are we that she is entirely equivalent to man; not so good at voting and jury-work, perhaps, but equivalent in general to man, and in *intuition* she far excels. If we examine feminine intuition, we find it to consist essentially, first, of subconscious feelings and emotions; second, of subconscious reason; and third, of a more or less conscious understanding of a life-situation. Woman is more sensitive to these dim, subconscious impressions, and what is more, has learned to trust them. A mother's intuition regularly is greater than all others, for the biologic interest is greater in the mother than elsewhere. Some day, in the year 2037 or 2698 perhaps, the mothers will teach their children up to, say, nine years of age, for they will be fit then to do so.

The modern recent playground experts and physical educators will perhaps fuse their part with that of Seguin, Montessori, Witte, Sidis, and the others, and with that of Berle, Mrs. Stoner, and Wiener, into a practical coherent system of intensive out-door home-education, until the boy or girl is nine years old at least. Great possibilities certainly exist for such a fusion into such a system of elementary education. And by then the mother will know how to administer it, and find her greatest joy in doing so. Let us hasten that day.

Even now (civilization is only 10,000 or 12,000 years old, but a moment in our racial history of a million years) many women and especially mothers realize their opportunities in the educational direction. Many realize how basally educative is the home.

In my course in principles of education, we discuss ten educative influences in the home: Hereditary talent and substantiality; the recognition of authority; religion and ethical training and knowledge; knowledge and guidance in sexuality; home-reading; domestic science proper; physiological habituation; hygiene; intensive home instruction. The last three (the formation of habits, hygiene, and intensive home education) are part of our subject this afternoon. Many mothers and older sisters and fathers realize the importance of these influences and practice them by teaching them to the boys and girls. To them this special word. But how many do not! To them this general word of appeal is needful

and expedient. Even though children are unconscious of it, and very often the parents also, nevertheless the children cry out for practical wisdom.

Wisdom of how to live well—life-psychology, is what I mean. Three hundred thousand years ago when our ancestors wore only skins and lived in caves (before the Ford war-relief, the wireless, the "busy Berthas," even before men had to hang on straps going home) perhaps parents then paid relatively more attention to this element of a child's education than they do now; how to live: shoot, sew, cook, tend the baby, even "chase the growlers,"—but away from home then rather than into it. Since men learned to print and make lasting books, this phase of education has undoubtedly degenerated, proportionally to the rest.

My present notion of the ideal gift for your children, then, is for *more personal educative association with them*, especially when young and up to, say, nine or ten years of age. This (in general the most important of all things in many person's lives) can not be learned at all as yet in any one school-series anywhere; no school has such a "study." The sweetest association almost in the whole world in this: this spiritual influence over your own offspring in practical life-psychology. It is "handing on the lamp of life" in one of its most substantial aspects.

"Dreams that the heart doth hold
Shall the later years forget?
Days of the drifted gold,
Shall you fade and wane and set?
Let the moon grow cold, let the stars grow old,
But stay ye a little, yet."

Psychologists are you all, though you may not know it. Psychologists enough at least to understand your own children's minds and to start them on the right road to wise living and self-control in the broadest sense; what your fathers and your mothers taught to you. Psychology is no mystic lore, no esoteric alchemy hard to comprehend; but a plain simple science much of which your child of seven or eight could readily understand if properly explained by one who really knew how.

Do not, I beg, let the term psychology, with its foreign-looking first syllable, worry you or scare you away. The Greek patriot who sells you vegetables is not dangerous just because his name is Theophilous Hadzikyriakes, nor on that account are his pears any harder to digest, or his prices harder to understand or to pay. Psychology likewise is tame when familiar. The science still maintains in spots some false pride, a little haughtiness or arrogance (because descendant of Plato and of Democritus, is it?), but in reality, modern psychology is as splendidly fitted to be one of the most essential of all grammar school studies as to be work for the philosophic doctorate in a university. You, as applied psychologists, should be, I repeat, the instructors of your children in the psychology of life wisdom. To be so is a privilege as well as an obligation, and assuredly an obligation as well as a delight.

Now, at length, is our cat indeed out of our Christmas bag, or down off the tree, so to say. This is the bait with which I have caught your kind, idea-seeking attendance here this afternoon; this is "the ideal gift to your children"—

worth to them, think I, anything else you could give them, if not more: Some practical psychology, some wisdom of how to live well. More intimate guidance in those concerns with behavior in which they are wholly dependent on you, is what I mean.

This is a birthright, not a privilege, and it is one of the children's many inalienable rights, only one or two of which so far man has recognized and then allowed. A father had a life-and-death right once, and even a son, and much less a daughter, had scarcely a right merely to live. Today we have passed beyond that grossly brutal stage, and now other rights less material and all the more important press for recognition. Conspicuous among these children's rights is that of inheriting by nature the wisdom of the parents and of their parents. Experts in the re-education of delinquent children recognize and emphasize these home-influences. The well known Dr. Wm. Healy, of Chicago, in his recent work on dishonesty, says: "School information is superficial compared to the realities of social behavior and charity that are taught first under the parental roof. Going over our juvenile court material of one thousand young repeated offenders, averaging fifteen and one-half years of age, we find that in no less than fifty per cent of the cases the natural parental relationships were incomplete. Moreover, added to this, there were many other instances in which there had been just as little parental supervision as if the parents were dead or living apart. . . . Both the negative and positive phases of a child's mental life and conduct are imperiled without parental care." In no one of its aspects certainly is it more essential than in this matter of bad-habit prevention.

But talking until New Year one could scarcely exhaust the possible directions which this applied psychology might take; this wisdom of how to properly live, unwritten, and unattainable otherwise by the average child.

Today, I am thinking of one part of this maze only, but that is an important part; namely, *our usual utter slavish servitude to habit*. The great psychologist, William James, worked out the practical aspects of habit. One sees there and all about him that even the children, and young children, already are "slaves of habit," "creatures of habit," bound firmly with often invisible chains to a behavior-series which they themselves are choosing day by day, minute by minute, though they know it not.

Good or evil, habit is surely our master. Because in this vast kindergarten of our lives, habit and habit's useful restraint are but the two basal aspects of "the great chain wherewith we are bound" to be sure, but also the very guerdon of our slavery. Here is the respect in which our "wills are not free;" here this ancient endless discussion of the "freedom of the will" gets its only sanction—in the psychology of habit. But it is every child's to make it free.

In a dental institution you not unnaturally expect to hear about the mouth or the throat or the nose, let us say about the inside of the face. Some of you, however, will be less interested in what I am about to say were the effects of this special servitude to habit wholly confined to the "inside of the face," not affecting at all the outside and its important beauty.

Knowledge and understanding, then, (to be finally explicit) of the psychology

of habit (especially as it concerns the face) is my own suggestion of the ideal gift to your children, during this winter, say, and next summer and on and on.

Recall, if you please, our noted criteria of an ideal gift, and then observe that this is "not already possessed," probably; certainly, "continually useful;" lasting life-long; a "constant reminder of you," its givers; not very expensive, in fact a fine investment and not an expense at all; and, lastly, that it is "not otherwise to be had" in all human probability by your children, until too late, at least, to be of use to them. In general the most valuable things cost least; air, water, sunshine, heat, light, happiness, wisdom, life itself.

The science of habit, explanation of why habits form, may be stated very briefly for our present purpose as follows: The infant from birth (save when asleep) is so built (his nerves and muscles) that universal bodily movement is maintained. Movement-hunger, the "impulse to activity" keeps up this universal movement because the sensations arising thus are pleasant in themselves. Now, more or less by chance some of these movements prove especially gratifying and satisfying and therefore tend to be repeated over and over, and so to form habits. The sources of the satisfaction which underlies the formation of habits are nearly as various as the habits themselves. To name them would be to describe, almost, the motives of a young child's behavior, for almost universal is habituation.

Very few, even of biologists and psychologists, realize as yet how almost literally universal habit is in our movements (technically, altogether, called our behavior). But this is a fact and the fact has much importance. Only in an extremely few cases are our acts not in part already made easier by this process of habituation, namely, in truly voluntary acts.

Nature's object well attained, of course, is *economy*; economy of time, of energy, and of variation. Motions are done quicker, more easily, and more uniformly when they have been repeated until some degree of habituation has been secured. Practically our whole life is a habit-forming free will; from birth and before the process is going on. During the first months after birth the child's education gets under way in the form of physiologic habits of eating, sleeping, etc., out of which as a base the more personal habits may gradually develop. This is Nature's thrift, her practice of economy.

But a principle so basal and universal in action would be certain to work some harm as well as much good. So, in the absence of supervision, some movements and acts are made habitual that are contrary to the inherent and natural rights of the child. He becomes, *pro tanto*, the victim of the vast rolling wheel of life, made slave by the "great chain wherewith," as Walter Pater says, "we are bound."

Among the many natural inborn rights of children scarcely recognized as yet in any effective way, are the rights to be first, as *healthy* and, second, as *beautiful* as nature and nurture allow. These rights are as "inalienable" (as our national Constitution says it) as the right to be *happy*. Indeed the three are inseparable part and parcel of one portion of life, namely Youth and Childhood, "holiday," when already we have crossed one of life's borders and are still free from care. Health, beauty, and happiness, these three, are inherent parts of normal childhood. A girl-body's beauty, as Maurice Hewlett says about "Sanchia's," "is but

a poem written by God about her soul." But underlying this is the one only means by which any girl and any boy may arrive at length at personality, namely, the body itself, the material agent logically necessary in a material world. What parent, what nurse, what guardian would not give the children universally these,—health, beauty, and happiness? One of the surest and shortest methods is through psychological guidance.

The human face is the index of our personality, of our humanity itself. It is the most beautiful of all created things known to man. To preserve its normal beauty is a duty, a birthright due to every child. The outside of the human face is the at once most beautiful and interesting of all material objects whatsoever of which we know. The inside (that complex of organs and structure behind the "mirror of the soul") has more concern with health than has any other one portion of the body, and given health and beauty, happiness is not far away. This matter is really more important than the necessary brevity of its statement might suggest to you.

It is to habits of the inside and outside of the face, then, that your psychological interest in your children is to be especially directed: first, to prevent the formation of bad habits, and second, to bend them (when they are formed) down and out. No longer do we "break" habits or try to do so, lest in the fracture the delicate nerve-system, all around them, be broken too. But we bend habits freely and finally displace them out of the child's mind and so out of his behavior.

Let us note, now, some of the classes of bad facial habits which it is the duty of the Post-Graduate School of this Infirmary to discuss. I may be excused, probably, if I quote from a recent lecture on the psychology of habit:

"More or less arbitrarily we may consider four groups of kinesthetic habits especially, which lead to deformities of the mouth and of the dentition. In the first class we have the group which we may characterize as sucking movements, which involve the sucking of the thumb and fingers, fist, either lip, the tongue, or the clothing. Some of the worst cases of paradontic deformity come from the rather common habit of biting the clothing; boys especially get in the habit when young of biting the clothes and tugging on them. Perhaps more practically important than this, because commoner, is the use of the so-called "pacifiers," which really should be called something else, even defacifiers. A second group of actions is the biting-habit; biting either lip, the tongue, or the hands. Biting is a well-defined instinctive movement in most young mammals. Third, a group which requires less effort than the other two, namely, mouth-breathing, one of the commonest, I take it, of the causes of malocclusion. It appears to be always forced by a respiratory obstruction. The passage of air through the nose is normally, at least, as easy as it is through the mouth, so that no one with entirely unobstructed posterior nares breathes through the mouth. The fourth class of paradontic habits includes a very large number of arbitrary actions, including those of the busy hands in relation to the mouth, all sorts of tractions, distentions, etc., habits of many kinds that young children and sometimes older children get into, of handling their mouths in many various ways. I do not need to cite the numerous other causes of malocclusion, but there are at

least thirty-five conditions which have been mentioned by witnesses as causes of this kind of deformity, diseases, maldevelopments, pure habits, too complex to even mention here, today. As important as any one thing is the use of "pacifiers," of many kinds, something that may be sucked, the sucking being, like virtue, its own and only reward. "Pacifiers" indeed! Men use them, you say? Men may use them (cigars), but not babies; it is a man's right, but in his case the defacement is relatively small.

To prevent the very existence of these unhealthful and disfiguring habits and such as these, is a psychological privilege, it seems to me, of every person who has any care of any child, from birth to puberty. It is also an obligation, and one not to be escaped without the bruising of one's conscience.

Every child has a right to be as beautiful as nature allows, indeed it is a duty to be so. But "cosmetic values, of course, are very greatly disturbed by some of the muscular habits that children get into. If we compare the women with the children who sit before us in the trolley-cars, for example, in this respect, we can see the effects ahead as well as the causes behind. You can readily point out certain children who, when they become adults, will have badly deformed, and perhaps unworthy, faces simply because they have been allowed to form the habit of holding their mouths, and so on, in various postures which are going to become fixed. How many good men are needlessly scared away from matrimony by this contrast between the middle-aged women whom they sometimes see and these women's children. Physical education should care for these conditions," but, out of inertia, it has not yet taken up systematically this task, much as it has done elsewhere for the betterment of the world.

The standard from which to judge whether a bad habit be developing or not is one of pure common sense. It needs only this, and no technical professional wisdom.

The practical method of preventing the formation of these habits of, on, and within the face, with the complicity often of the hands, is as simple yet as scientific as well it might be: *A self-interested understanding of the conditions involved, both immediate and future, an appreciation of the process, in short, and of its effects. Impression of the subconscious mind and hopeful encouragement, with the necessity of continual initiative of restraint.* In the way of prevention, nothing can be done from without but this, nothing at least that is at all justifiable as a preventive method. On the other hand, perfect success by this method oftentimes is assured, at least in proportion to the intelligence and the promise of the individual child. One can not do more than this. Indeed, here in a way is almost a measure of the mortal's effective self-respect and of his proper educability. One can not do more. But in the long run it is safe to say that no child is going to allow her face to be disfigured, or her nutrition to be jeopardized, if she really understands fully her power to prevent such catastrophies. Why not let her and her brother understand it as fully as you can? And if no such habits impend, then the like philosophy of other bad habits which are fairly sure to be forming? As in psychotherapeutics, "mind-cure," there must be full comprehension and stimulating encouragement. These means will do much, very much more than you probably believe until you actually try them, to prevent bad

habits of many kinds. You must secure in the child a continuous, if subconscious, attention to the task. The self-protective mechanism of the mind tends to accomplish the rest.

The sad familiar lines of Wordsworth sing in one's ears:

"Full soon thy soul shall have her earthly freight,
And custom lie upon thee with a weight
Heavy as frost and deep almost as life."

But once formed, you ask, how may these disfiguring and often dangerous deformities of the face,—so far functional and habitual, and not "grown in"—be cured? The means and methods have been hinted at already, but it may be made more explicit in seven points:

1. Not, at any rate, by literally "breaking" the habit. In adults, unless they be unstable, habits may be and often mercifully are, broken off short, although with raw and bleeding ends and edges of agony—the morphine habit notably. Habits can not be broken in this way in children, at least not after the age of two or three months. The problem here is a very difficult one, as difficult as childhood is from age.

2. The method then of bending bad habits down and out of a child's behavior is that again of psychological therapeutics, "mind cure." *A self-interested comprehension of the hard conditions involved, immediate and remote; with a vigorous impression and encouragement of the subconscious mind with the absolute necessity of continuous restraint.*

It is in this idea of the *incessancy* of the requisite personal control of the impulse to habituated action that the difficulty chiefly lies. James has emphasized in his discussion of habit what we all feel to be the very heart of the matter: "Each lapse is like the letting fall of a ball of string which one is carefully winding up; a single slip undoes more than a great many turns will wind up again." Hence the need of employing sentinels and guards that never sleep and which are to be absolutely relied upon; for the impulse to activity knows no such thing as inattention, but every moment watches for an opportunity in proportion to its habituation.

No other guard whatever serves or can serve this supreme watchfulness save the (subconscious) mind itself, loyal protector always, without a lapse, of the best interests of the individual so far as they are impressed upon it by the freer intelligence and through the stringent orders of the emotional, dynamic phase of the child.

It is like inducing an individual to be good or to be kind or to be gentle, or an active youngster to be quiet. It requires continual effort from within. This, however, is an education in itself. This indeed is pretty much of the whole matter: a true and full understanding of the habit-trap and its injuries, and of the ease and certainty of escape provided the child consciously and subconsciously really and sincerely wishes to be relieved of it. It all depends on continuous voluntary initiative founded in enthusiastic confidence and determination.

3. Encouragement and confidence are essential, for the average child has as yet little self-reliance. It is part of his very childhood not to have it, and the wholly self-reliant child is already a man or a woman.

4. Another essential feature of the educative habit-bending methods is that one habit only at a time, for the most part, may be attacked. The reason for this is the wise old adage of our grandmothers:

"One thing at a time and that done well
Is as good a rule as any can tell."

In the physiologic terms of psychology, this is the principle of the "final common path," or, in this case, of cortical resultants.

5. The depression and the discouragement of fear and worry are wholly out of place in this inherent bending of a child's subtle and sensitive mind. Fear and worry block the will and hinder it, and lower its vigor as they do its spontaneity. Fear is wholly incompatible with the best results in such influence as this, and that wholly aside from the danger of imparting a lasting shock to the brain of a child.

This necessity of avoiding fear and worry in the child, eliminates serious threats of future punishment. It rules out, too, all harshness and severity. This is not that kind of a problem at all. You do not threaten a boy or abuse him for a too long convalescence from tubercular hip disease; neither should you in this case.

Punishment is in fact outside this whole matter unless, be it first, of a mild sort; second, highly successful; and, third, free from all terror. Corporal punishment would be an absurd factor in a process of subtle reform from within outward such as we are discussing. You must impress the mind rather than the soft part of the back, and so in principle all through. The whole Freudian doctrine of repression and rankling and nervous exhaustion comes into this problem when early shock or fear has been incurred. The far-reaching evils thus made possible would be worse indeed than the original bad habit; in this case, undoubtedly, the remedy is infinitely worse than the disease.

6. Busy normality of the nerves and muscles and glands is an important adjunct, and often a necessary preliminary, to habit-bending when the habits are of serious import to the child.

Back to the farm, even in winter. Months of freedom and plain outdoor living among the beautiful hills and rapid streams and the maple groves of Vermont or along the satiating Acadian seashore,—herein lies invigoration. In practice sometimes only in this manner is the mechanism of nerves, muscles, and glands given its normal vigor to recognize habit abnormality; to refuse its allurements; and by its inherent powers of self-protection to bend it out of existence again.

In many cases of deranged moto-sensory habit an active and conscious normalizing thus procured, in intelligent children, is enough almost in itself for a cure.

7. In other instances it must be admitted, the skilled orthodontist or even the surgeon finds his wits well taxed to make things right. But the way of ways is prevention rather than cure, a system for guiding the daily inclination of the "twig" rather than the difficult and tedious and even dangerous back-bending of the "tree." We call prevention of this kind by a familiar special name, prophy-

laxis, but more properly, here, it is psycho-prophylaxis. Prophylaxis is scarcely born as yet in either medicine or dentistry. When, however, (before many decades) it has become part of the common mind of all the people, how crude, how extravagantly wasteful, will seem the neglect of the present day! Nothing less than shameful to our boasted human intelligence is the colossal wastefulness of happiness and life and money in this respect. What is it then which many of us are so much in a hurry to obtain that we cannot stop to live? We should prevent disease, altogether, and deformity.

It is fortunate, indeed, for us all that this bending of a habit itself becomes habitual and so ever easier and easier. "To him that hath shall be given." "God helps those who help themselves." Thus the habit of bending any particular habit soon becomes habitual, as do the habits of close study, of taking sufficient exercise, of cold morning baths, of giving your loving wife her inevitable last word, or of any other habit hard, often "beastly" hard, at first to compass. So the child by trying at last succeeds, and more easily, often, than at first seemed possible. And by trying, whatever his years, he becomes a personality—a man—captain of his soul.

Nothing is finer, let us be sure, or few things, at least, in this wondrous life of ours than this slow, hourly mastering of ourselves, a bit by bit, day after day. Then at length we begin to appreciate the privilege of being conceived and born into even a brutal world, an experience often harsh and worrisome and sad, often cruel, even, to a wholly unbelievable extent, but always, notwithstanding, full of an almost inexplicable joy arising to a large extent in our own dominance of ourselves.

This joyousness of satisfaction has its most familiar symbol in the crushing of inexpedient habits,—links in that great living chain with which life forever binds itself, but through which alone human personality is conceivable.

DEPARTMENT OF DENTAL AND ORAL RADIOGRAPHY

JAMES DAVID MCCOY, D.D.S., EDITOR
LOS ANGELES, CALIF.

THE RELATION OF RADIOGRAPHY TO ORTHODONTIA*

BY WILLIAM A. GIFFEN, D.D.S., DETROIT, MICH.

THE roentgen ray as a diagnostic aid in the practice of orthodontia is indispensable. It is a fact that there is no other branch of dentistry in which the findings of this agent are so definite.

I shall first enumerate the conditions in which the roentgen ray will eliminate all guess work for the orthodontist in making a diagnosis of his case:

If the roots of the deciduous teeth are interfering with the eruption of the permanent teeth.

If the permanent teeth are present.

If they are in a normal position.

If the supporting osseous tissue is of normal density.

If there is delayed eruption—what is the interference.

If permanent teeth have been injured by instruments in removing roots of deciduous teeth.

If in delayed eruption the cause is want of space in a certain direction, can sufficient space be obtained?

The progress of eruption of teeth which have been delayed.

If devitalized first molars or other teeth are present, are the surrounding areas free from infection or evidence of toxic irritation.

If there are any supernumerary teeth present.

If there are cysts or odontomas or other anatomical deformities present.

If pyorrhea pockets exist.

The orthodontist, as well as the general dental practitioner, must take advantage of this valuable aid in the future in order to protect his professional reputation.

It is the writer's opinion that the chief reason so many dentists do not take advantage of the roentgen ray is their desire to save their patient the expense of such an examination. This is a foolhardy policy upon which to conduct a dental practice, for even if an occasional patient does object to the expense or for any reason does not see the importance of such an examination, it is the plain duty of the dentist to at least explain to his patient the possible advantage of the examination; for as a matter of fact owing to the publicity which has been given to the bacterial origin of most human ills through the

*Read before the Alumni Society of the Dewey School of Orthodontia, Chicago, Ill., March 13, 14, 15 and 16, 1917.

current magazines, the laity are not so ignorant of health questions as many seem to think they are. A dentist should not be afraid to lose patients with so little intelligence they can not realize the value of good health and appreciate honest effort of their dentist to protect it.

AVAILABILITY.

There is no reason why any one of you can not learn to make radiographs if you feel inclined to go to the necessary expense to equip yourselves and can give the time necessary to work out the details of the technic. The essential requirements are an efficient apparatus, industry, common sense, and a knowledge of the danger of too lengthy or too often repeated exposures to the rays. However, this is the simplest part of the work as it requires a great deal of study and practice to become proficient in the interpretation of the radiographs after they have been made, no matter how good they may be.

It is a fact that fifteen operators have sacrificed their lives in this country alone, and many operators and patients have been maimed and disfigured from the same cause. So should any of you decide to take up this work, never fail to fully protect yourself and your patient.

SYSTEMATIC TECHNIC NECESSARY.

As in all other dental operations a definite procedure should be followed in making the examination. A clinical record should first be made by marking on a chart of the mouth all lesions which can be seen or discovered by a digital survey, such as fistulous openings through the mucous membrane, swollen or tender areas, ulcers, enlarged areas either hard or soft over the labial and buccal or lingual surfaces of any of the roots of the teeth; all missing deciduous or permanent teeth crossed out; also check off any teeth suspected of being nonvital. Fillings should also be marked on the chart. With this chart record to refer to the operator will be enabled to sum up the findings of his roentgenograms and arrange them properly on his mountings, accurate and in the minimum of time.

The position I prefer for the patient is in the dental chair tilted back, and for centrals and laterals place the film parallel to the long axis of the medial line and direct the rays on the film as nearly at mean angle between long axis of tooth and film as is possible. For cuspid and molar region place film parallel to long axis of first molar and direct rays on film as near the mean angle as possible, the patient holding the film in position with the thumb. For right side of face use left thumb and for left side of face use right thumb, either upper or lower. In the lower cuspid and molar region place the film parallel to the long axis of the first molar and direct the rays as near to right angles of film as is possible.

As a rule children rather enjoy the examination when they understand that it will not be painful, although it is hard to get them to hold the film for lower bicuspid region occasionally when the soft tissues of the floor of the mouth must be depressed. In difficult situations of this kind place the patient on a table with the head on a soft pillow, using a 5x7 film on the outside of the mandible.



Fig. 1.



Fig. 2.



Fig. 3.



Fig. 4.



Fig. 5.

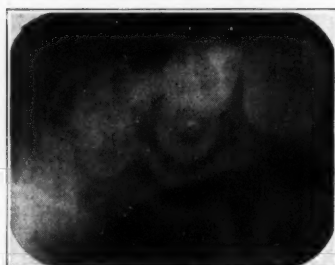


Fig. 6.

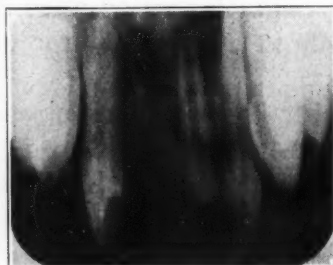


Fig. 7.



Fig. 8.—An unusual case of missing lower centrals.

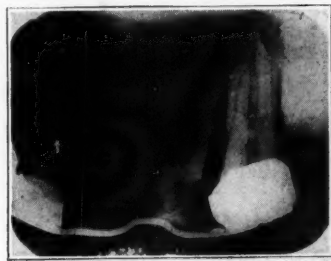


Fig. 9.—Bicuspids not present. Lack of bone development.



Fig. 10.—Delayed eruption caused by retention of deciduous molar root.

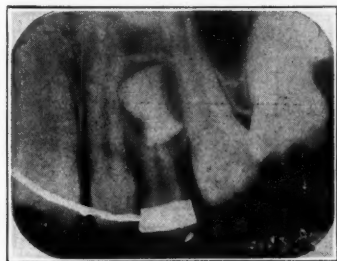
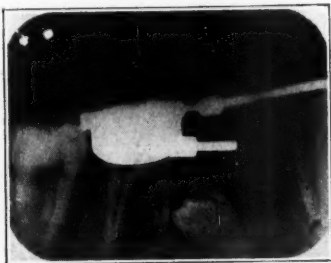


Fig. 11.—A remarkable case. One bicuspid tooth absent, the crown of the other bicuspid being malposed, the cuspid having erupted distal to it. Development of bicuspid has been arrested and also shows a great lack of osseous development mesial to first molar.



Figs. 12 and 13.—Delayed eruption. Lack of space.

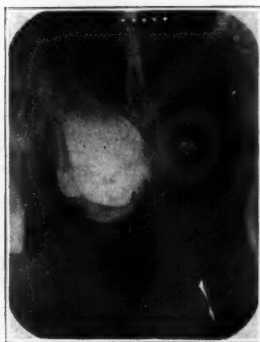
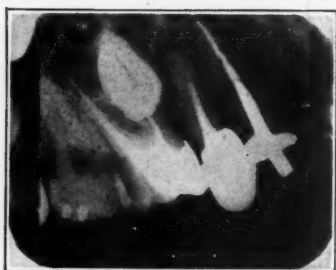


Fig. 14.—Showing encysted central. Girl 16 years of age.



Figs. 15 and 16.—Showing serious results produced by unerupted teeth.



Fig. 17.—A supernumerary lateral apparently perfectly developed.



Fig. 18.—Two permanent cuspid and lateral teeth fused together.

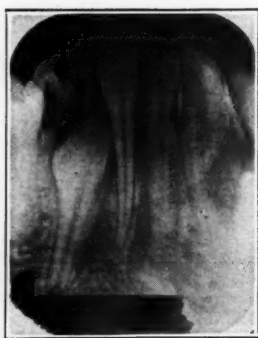


Fig. 19.—Deciduous lateral and cuspid fused together. Permanent lateral missing.



Fig. 20.—Shows evidence of toxic irritation at apex of mesial root of lower first molar.

The best detail from a photographic standpoint on the negative is obtained in young patients by using Hydrogen Tube on transformer with a spark gap resistance of four inches, while passing thirty-five milliamperes at a target distance of eighteen inches through an aluminum filter and two and one-half inch compression diaphragm. Three second exposure for incisors and lower molar regions and four seconds for upper molar region.

INTERPRETATION OF RADIOGRAPHS.

Figs. 1, 2, 3, 4, 5, and 6 represent a roentgen ray examination of a normal mouth of a normal little girl at the age of five (the daughter of a Detroit dentist).

The deciduous teeth are normal, except for gold fillings in upper molars. The permanent teeth are all present and in a normal position. The supporting osseous tissue appears to be of normal density.

Fig. 7 shows upper incisors of a girl of eleven years with the following history taken from her record as filed by the Detroit Board of Education.

Minnie: Eleven years old. Mental age 6 years, 8 months. Height 4 feet, 9 inches.

Mother: Lizzie, 37 years. Weighs 102 pounds. Married at 16. Three living children—1 dead. Six miscarriages before Minnie was born. Minnie is tenth pregnancy. Had right ovary and tube removed following Minnie's birth. Positive Wassermann, Aug., 1915. Mercurial and salvarsan treatments. Attributes condition to infection from husband.

Father: Died at age of 42 years, Dec. 28, 1916, of paralytic stroke. Was intoxicated at time of stroke. Sick one week. Was chronic alcoholic.

Minnie: Full term normal birth. Born in hospital. Mother ill 3 months before birth and 3 months following. Bottle-fed. Has had measles, mumps and whooping cough. Eye trouble was first noticed March, 1916. Taken to Children's Free Hospital, July, 1916; there until August. Wassermann, negative.

Diagnosis.—Interstitial keratitis. Congenital syphilis. Weight 62 pounds. Head circumference $19\frac{1}{2}$ inches. Black hair, brown eyes. Poor appetite. Personal hygiene fair. Eyes in such poor condition that she must either stay out of school or be in class of partial sighted children. Attended kindergarten and B first grade irregularly. Home conditions unsanitary; ordered by Board of Health to move.

The International Journal of Orthodontia

PUBLISHED THE FIFTEENTH OF EVERY MONTH BY

THE C. V. MOSBY CO., 801-807 Metropolitan Bldg., St. Louis, Mo.

Foreign Depots—*Great Britain*—Henry Kimpton, 263 High Holborn, London, W. C.; *Australasia*—Stirling & Co., 317 Collins Street, Modern Chambers, Melbourne; *India*—"Practical Medicine," Egerton Street, Delhi; *Porto Rico*—Pedro C. Timothee, Rafael Cordero 68, San Juan, P. R.

Subscription Rates—Single Copies, 30 cents. To anywhere in United States, Cuba, Porto Rico, Canal Zone, Mexico, Hawaii and Philippine Islands, \$3.00 per year in advance. Under foreign postage, \$3.40. English price: 15/ per annum, 1/6 per number. Volume begins with January and ends with December of each year.

Remittances—Remittances for subscriptions should be made by check, draft, postoffice or express money order, or registered letter, payable to the publishers, The C. V. Mosby Company.

Contributions—The editor will be pleased to consider the publication of original communications of merit on orthodontic and allied subjects, which must be contributed solely to this journal.

Opinions—Neither the editor nor the publisher hold themselves responsible for the opinions of contributors, nor are they responsible for other than editorial statements.

Reprints—Since it is not desirable to hold type standing longer than absolutely necessary, all requests for reprints should be made at time of submitting manuscript for publication. Rate card will be sent with galley proof.

Communications—Contributed articles, illustrations, letters, books for review, and all other matter pertaining to the editorial department should be addressed to the Editor, Doctor Martin Dewey, 25 East Washington Street, Chicago, Ill. All communications in regard to advertising, subscriptions, change of address, etc., should be addressed to the publishers, The C. V. Mosby Company, 801-807 Metropolitan Building, St. Louis, Mo.

Illustrations—Such halftones and zinc etchings as in the judgment of the editor are necessary to illustrate articles will be furnished when photographs or drawings are supplied by the authors of said articles.

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Entered at the Post Office at St. Louis, Mo., as Second-Class Matter

EDITORIALS

The Responsibility of Dental Editors

AT the present time there is considerable advocacy among the various dental editors in an attempt to make the advertising section of the dental journal coincide with the belief of the editorial department. In times past we have been confronted with the proposition of a dental journal being edited by a man who had a high standing in the dental profession, who stood for certain ethical principles and who would be compelled to admit or see those same principles violated in the unscrupulous advertising which appeared in the advertising pages of the dental journal. We need go back only a short distance to recall that a similar condition formerly existed in the pages of a great many daily newspapers and it was with considerable difficulty that newspapers succeeded in making their advertising column coincide with the wishes of the editorial department. In other words, it was only in those papers in which the editorial department was large enough to control the advertising pages that we first saw

questionable advertising eliminated. We can even remember when we were confronted with the incompatible proposition of the religious weekly and Sunday School papers which in their reading columns told about the evil of intoxicating liquors, the great demon rum, the horrible sins of intemperance and various other crimes of a similar nature and then by turning to the advertising page find such advertising as "stomach bitters," Peruna, and even Duffy's malt whiskey. We are glad to notice that most of the religious weeklies have gleaned out their advertising columns until now the advertising matter is no more apt to send a man down the crooked path so far as intoxicants are concerned than are some of the articles in their editorial department. We are also pleased to notice that the majority of large powerful daily papers have also gleaned out their questionable advertising matter until now things are in a much better shape than they were formerly.

Medical journals have for a number of years carefully gleaned out their advertising, eliminated those advertisements of a questionable character and those which made statements which they could not in any way substantiate. At the present time a number of dental journals are attempting to do the same thing, but we regret to say that there are still some powerful dental journals in which the editorial department absolutely refuses to be held in any way responsible for what appears in the advertising pages. We are aware of the fact that even the *Journal of the National Dental Association* in times past contained advertisements which were more or less questionable, but we believe it is the policy of the journal to eliminate such advertising as soon as attention is called to it. However, as we have stated before there are a number of large dental journals with a large circulation in which the editorial department attempts to entirely divorce itself from the advertising pages, claiming that it is in no way responsible nor does it even care what appears in its pages. We remember recently an editor of a large dental journal making a statement that he never read the advertising that appeared in his own journal because he did not care what was in there as he was concerned only with the editorial policy. While that may be one way of ridding oneself of the responsibility, nevertheless, it appears quite embarrassing for a man to advocate one thing editorially, for one thing to be advocated in articles in his journal, and just exactly the opposite to be advocated in the advertising pages of his journal. We do not believe an editorial writer or editor of a dental journal should excuse himself by saying he does not read his advertisements and is therefore in no way responsible.

The same editor also made the statement that it was a very difficult thing for dental journals to control their advertising matter, for if a journal refused to publish the advertisements of one concern, the concern could get out an injunction claiming the journal was not fit to circulate through the mails, and thereby cause a great deal of trouble to the journal before the same would be allowed to be circulated through the United States mails. This argument is about the same as if someone were to say that we should not criticize anything regardless of what it is because someone would be liable to bring a damage suit against us and we would be compelled to defend ourselves in a damage suit.

We realize through the laxity of the United States Court that it is possible for anyone to file suit against anyone else, for anything whatsoever, thereby causing the party to be inconvenienced in defending the suit. Nevertheless, we believe that the advertising pages of a respectable dental journal should be controlled by the editorial department. While it is almost an impossibility for an editor of a dental or medical journal to read all the advertising matter which is to appear in his journal before it is published, nevertheless, it is not impossible for the publisher of the journal to have a contract so arranged with their advertising customers that an objectionable copy of an advertisement can be eliminated if the advertising copy is objectionable to the subscribers or the editorial department. Such a contract would eliminate the possibility of a damage suit by copy being refused and allow the editorial department the possibility of reviewing and changing such advertising as is objectionable to their readers.

We realize that a certain number of dental journals are run solely for the advertising department and advertisers, and the scientific section becomes secondary. This is proved by the fact that a large number of dental articles and scientific articles are nothing more than commercialized articles for we remember a short time back a famous so-called scientific article appearing in the first pages of the reading matter of a dental journal while in large type appearing on the first page of the advertising section was a large poster advertisement calling attention to the article which appeared in the scientific section. In other words, the article in the scientific section was describing a commodity which was sold by the house that published the dental journal and which article was the same as was featured in the advertising section. Therefore we can only expect such dental journals to make their scientific and editorial sections secondary to the advertising sections, which impresses upon us the prime need for dental journals to serve the scientific wishes of their editors and readers and not to serve the advertising managers of supply houses. We also realize it is a very difficult proposition to satisfy all of our readers as regards scientific articles and advertising.

Recently at the meeting of a society of national reputation, the society discussed the proposition of requesting certain dental journals to be more careful in regard to their advertising matter. After they had criticized the advertising pages of certain trade journals they suggested that certain independent dental journals be more careful in regard to their advertisements and then the society further embarrassed themselves by voting that the proceedings of that society be published in a trade journal whose editor claims that the editorial department has nothing to do with the advertising department. In other words, they became instrumental in assisting and furthering the very thing in a dental journal which they were trying to criticize or trying to regulate. This simply shows the inconsistency of attempting to satisfy everyone, for a great many people are inclined to look at things in a different light and especially from a different viewpoint when it effects them personally. However, it is our belief that dental journals which are attempting to advance dentistry as a science, independent journals which are anxious to build up independent departments, and journals

that publish the proceedings of orthodontic societies should assume some responsibility in regard to the advertising department.

We recently remember seeing a dental journal which was the official organ of an orthodontic society publish an advertisement of an orthodontic appliance, which advertisement was an insult to the intelligence of every practicing orthodontist who was a member of the society for which the journal published the proceedings. The advertisement made certain statements in regard to the use of that appliance, claimed the appliance accomplished certain things within a certain definite time, which ninety per cent, if not one hundred per cent of the members of that society knew was absolutely impractical. Therefore, we consider in that case the editorial department of the journal was lax, allowing advertising to appear in the journal which was an insult to a large number of its readers. However the whole question is whether a dental journal should be run for the interest of dental science or for the interests of the trade houses which publish a large number of them.

We admit that advertisements are a necessary adjunct to the publication of any kind of a journal. However, with the independent scientific journals, the policy is to publish a journal which, because of its high standing, will have among its readers the most desirable men in the science. Because of the readers which it has, it becomes a valuable medium for the advertising of articles and things which the readers of the journal are forced to buy, and in that and that alone lies the relation and the duty of an independent scientific journal to the advertisers. The advertisers have no right to make statements in the space which they pay for that is an insult to the readers of the journal, and not in keeping with the editorial policies of the journal. A journal should be run as a scientific publication first and an advertising medium second, which is directly the opposite of the policy pursued by some. Everything which appears in a journal should be responsible to one department and that department should be controlled by the editor-in-chief.

The Commercialization of Scientific Societies

AS we write this editorial we have upon our desk the programs of the state dental associations of a large number of states. In looking over these programs we are impressed with the fact that all of them make a feature of advertising dental supply houses and calling attention to the dental exhibits which are to be held at the state meetings. As a result of this we are forced to pause and wonder if dental meetings are for the advancement of dentistry as a profession and a science, or for the advancement of dental supply houses, or if the average state meeting as it is conducted is something to further the interests of dentistry as a science or something to further the interest of the dental manufacturer. In other words, are these meetings scientific gatherings, or are they commercial gatherings for the purpose of showing the latest things in office equipment?

We are aware of the fact that there are two sides to this question. In some

instances the dental supply men are compelled to pay the expenses of the state dental association. In a great many instances the privilege of getting out the program of a state association and the publication of the same is allotted to some dental supply house and in return, they are given a prominent place of advertising on the back page of the program. We are also aware of the fact that in times past many of the state dental associations have obtained the only available floor space which can be used for dental exhibits and have sold this floor space to dental supply men for a price much greater than what they paid for it. As a result of this, the dental exhibitors have been obliged to pay the expense of the state meeting for the privilege of making an exhibit at or in close proximity to the place of the scientific meetings. As a result of this procedure dental dealers are entitled to a certain amount of consideration, but, nevertheless, the fact that they are entitled to this consideration does not justify the means which have been employed in some instances in obtaining it. In other words, we are opposed to a state dental association, which is supposed to be a scientific organization, selling itself to dental supply men. If dental dealers are desirous of having exhibits at the time the state meetings are held, we are perfectly willing that they should make these exhibits; but we do not believe that the exhibit should be made as an adjunct to the state meeting or be in any way concerned or associated with the state meeting. When this proposition has been advocated it is then stated that the dental associations desire to have some control over the exhibitors or the exhibitors would continue to show their wares during the time the scientific sessions were being held and therefore interfere with the attendance at the scientific session. If this is true we regret it exceedingly, for if men attend a dental association to visit the dental exhibit, we are in favor of allowing them to attend the dental exhibits if they are more interested in them than in the papers to be read at the scientific session. If the members of the state associations believe they can get more good out of dental exhibits than they can out of the scientific sessions, we are willing to allow them to follow the dictates of their own conscience for it will only be a few years until the man who bases his dental progress on what he learns in the dental exhibit will be a back number. We are not willing to admit that men attend the state meetings to see the dental exhibits, but we are inclined to believe that the dental exhibitors follow state meetings for the purpose of reaching the largest audience they are able to find gathered together in one place. That this is true can easily be proved by the large number of subterfuges which dental manufacturers have taken at the present time to use state organizations as a means of advertising their products.

In looking over the programs of the state societies which we have on our desk we find that two-thirds of them have somewhere in the program, mixed in among the scientific papers, a notice of a moving picture film which is supposed to show the manufacture of dental instruments. This exhibit is worded very beautifully and is placed in the different programs following papers on root canal technic, papers on oral prophylaxis and oral surgery, papers on radiography, papers on the treatment of pulpless teeth and their sequella, and the preparation of canals for filling and various other subjects. It would seem at

first sight, an interesting topic for dental societies, a good thing to know how dental instruments are manufactured. Along with the exhibit which shows the manufacture of dental instruments is the concealed invitation to purchase this instrument and in some cases there is also shown its use and application in the treatment of oral conditions. We are not opposed to advertising, realizing that advertising is a necessary adjunct; we realize that advertising must be carried on in order to push the sale of an article but we believe there are proper mediums for advertising certain things and the state dental societies' scientific sessions are not among those proper mediums. We consider it an insult to the dental profession or the state dental meeting for large manufacturing concerns to work in between the scientific papers moving picture films, the sole object of which is the advertising of their own products. The trade houses and dental supply houses have for a number of years attempted to control the dental meetings, the publication of dental journals or attempted to control the thought of the dental profession in regard to publication, and have now gone farther by attempting to influence state societies by producing moving picture films, which are nothing more than advertisements, in scientific sessions. The surprising thing is that state societies have allowed this thing to go as far as they have, have allowed the dignity of the profession to be so insulted by permitting these things to be published in their programs.

We realize the management of organizations, of scientific societies, and scientific bodies must constantly be on the alert to prevent very carefully arranged commercialized schemes creeping into their programs.

For a number of years, or, in fact, since, the foundation of the American Society of Orthodontists, the Board of Censors have used every effort to keep out papers which had a commercialized tendency, and while they have not been entirely successful, they have been more successful than the majority of other organizations. However, we are sorry to learn that the American Society of Orthodontists seem to have taken a step backward by the fact that they are now planning, at the next meeting, to have an exhibit of orthodontic appliances. In other words, they are inviting certain manufacturers, who have articles for use in the practice of orthodontia, to have an exhibit at their next meeting. While we understand that these exhibits will be no part of the program of the American Society of Orthodontists, that each exhibitor will be forced to buy his own space from the hotel management at so much per foot or at a certain rate which the hotels are willing to make, and that the society itself will have no connection with the exhibits; nevertheless the fact that they are inviting these men to exhibit at their next meeting is in our mind a decided step backward for a scientific organization. Again we say if dental exhibitors desire to exhibit, we have no objection to them making the exhibit, neither have we any way of stopping it and we do not think it is objectionable providing they do not attempt to make the state dental associations a means of furthering their own interests. We also know that some state dental associations and dental societies attempt to charge exorbitant prices for floor space to the dental exhibitors in an attempt to make the dental exhibitors pay the expense of the meeting. We believe that scientific societies should be so conducted as to pay their own ex-

penses and the membership be sufficiently large and the membership sufficiently interested in the advancement of the society that they are willing to pay the expense and not expect dental supply men or dental dealers to pay it. We therefore hope the time is not far distant when scientific organizations will be divorced from commercial organizations and each one will occupy the proper relation to the other and its affairs.

Orthodontic Appreciation

IN a short talk given by Oscar Busby upon the subject of "Orthodontic Appreciation" he made a few remarks which were worthy of more than passing consideration. He opened up a field of thought which requires more attention from the average orthodontist than it probably has received. The question of orthodontic appreciation has more bearing upon the practice of orthodontia than probably any other factor which we have to contend with. In other words, if our efforts are not appreciated by the public, it is very difficult for us to render a service, or to continue the practice of orthodontia. In fact, it has been proved that the necessary adjunct in the practice of any profession is to have the public appreciate the efforts of the men engaged in that particular profession.

The question of appreciation has been the primary factor in the success or failure of any science or art that has ever appeared before the public. Different methods have been adopted by business houses to force the appreciation of their efforts or the article which they have for sale upon the public. It has been stated that any man, who was able to design something which the public appreciated, something which the public desired, and which everybody appreciated enough to purchase, would be on the road to independent wealth. If orthodontia is to succeed as a profession, if the public must appreciate the value of orthodontia sufficiently to enable one to make his livelihood in the practice of that profession, it then follows that orthodontic services must be made attractive enough for the public to desire those services.

As a result of a number of years' experience, we find the appreciation of the public for orthodontic services is based upon a great many different propositions. One of the first things which causes the public to seek the services of the orthodontist is in a great many instances the correction of facial deformities. This was especially true in the past when orthodontic patients sought the orthodontists after the age of twelve years. After the age of twelve the majority of individuals who seek the services of orthodontists do so for the improvement of facial appearance. Therefore, in that case the orthodontic appreciation is based upon facial improvement that can be accomplished by orthodontic treatment. There is no question that the correction of a large number of malocclusions will improve the facial deformity or profile of the patient, but we do not believe that orthodontic appreciation based upon the improvement of facial deformities is the most desirable kind of appreciation. The reason for this may be stated that a large number of malocclusions that are the most serious handicaps to the individual from a physical standpoint

and from a masticating standpoint are those cases which produce very little facial deformity. In other words, the proper appreciation of orthodontic services should be based upon the knowledge that the orthodontist is able to render a service of a greater value to the individual than simply the correcting of a facial deformity. We have seen a number of malocclusions which were so extreme that mastication of the food was practically impossible, but the patient or parent objected to having the case corrected owing to the fact that the facial deformity was not noticeable and that the greater amount of energy would be expended on the posterior teeth and the patient was unable to see where the improvement would be sufficient to compensate the necessary financial outlay.

However, we are glad to note that conditions regarding the appreciation of orthodontic treatment are becoming better; that a greater number of people are seeking the services of orthodontists for the correction of malocclusions for their children at an earlier age than they formerly did; and that they are beginning to realize that the importance of orthodontic service lies in the correction of malocclusion, thereby improving the masticating apparatus and also improving the nasal organs, producing better breathing than would be possible if the malocclusion persisted.

In order to get a higher degree of appreciation for orthodontic services, it becomes necessary that the people be educated to realize that the benefit of orthodontic treatment lies not so much in the improved facial expression, but improvement in the occlusion of the teeth which makes better usage of the teeth possible, and therein lies a greater degree of health and comfort.

The Value of the Orthodontist in Military Service

IT is only since the beginning of the European War that military men have recognized the importance of the dentist in actual warfare. For some time the government has had certain regulations pertaining to dental conditions for enlisting men in the army and navy. It has been necessary for the men to pass the proper physical examination and to have the oral cavity examined. It has been found that a great many men have to have dental work done and the mouth placed in a healthy condition before they can be admitted to service. As a result of this, the Preparedness League of American Dentists was organized about a year ago with the idea of pledging the dentists of the United States for the purpose of preparing the teeth of otherwise physically able men so that they could enlist in the army and perform military service. The purpose of the League, as first organized, was that each dentist should at least fix one recruit's mouth so that he would be able to pass a medical examination. As the work of the League progressed, it was found desirable to organize dental units which would consist of the following: an oral surgeon, orthodontist, dental radiographer, prosthodontist, dental hygienist, and dental therapist. It may be said that the work of the dental therapist and hygienist and the prosthodontist are to a certain extent preparatory.

The work of the dental radiographer may be considered 50 per cent preparatory, and the other 50 per cent fits him for actual service in taking care

of the wounds of the injured. The work of the orthodontist in military life is necessarily that of repair. The orthodontist works hand in hand with the oral surgeon and consequently the greater amount of his work will be done during actual warfare. It is a well known fact that the work of the orthodontist in fitting bands upon teeth and his knowledge of occlusion makes him especially fitted for the treatment of fractures of the mandible and maxilla, and for the fitting of appliances to hold the parts and prevent displacement as a result of loss of the mandible and maxilla from gunshot and shell wounds.

There is probably no one or no branch of the medical profession in which men are better fitted to treat a large number of fractures and treat them successfully with the smallest amount of inconvenience to the patient and with the least loss of time than is the orthodontist. As a result of this, the orthodontist in the Preparedness League of American Dentists is very necessary, and will be even more necessary in times of actual warfare than in times of military preparation. According to the small number of orthodontists in the United States compared with men engaged in other branches of dentistry, in case of actual warfare if all the orthodontists were on the front, there would not be a sufficient number to adequately take care of the need. Considering this fact, it is very evident that the orthodontist has his particular line of work to do towards preparedness, and that line of work is to give instructions to the dental profession, under the auspices of the Preparedness League of American Dentists, as to the most feasible, easiest and quickest means of applying bands and ligatures in such a manner as to reduce fractures and prevent displacement of the parts resulting from gunshot and shell wounds. It is, therefore, hoped that every orthodontist will do his part in this preparedness movement, will join some preparedness league unit and give a series of lectures on the adjustment and fitting of bands, and adjustment of wire ligatures for the treatment of fractures. By giving the proper line of instruction to the units of the Preparedness League of American Dentists, the orthodontist will do something for the service of his country the value of which will be hard to estimate.

Scientific Versus Unscientific Orthodontia

THE visual observation of the most capable living orthodontist, the usual forms of measurements of models and the comparison of models with forms of arch supposed to be common to great numbers of cases, are of little value as guides to procedure in the practice of orthodontia. Indeed they are quite as likely to mislead as to lead correctly. Upper and lower models from one mouth were submitted to a large number of capable orthodontists for diagnosis by the methods common to their practice. All recognized that the arches are too narrow to afford room for all the teeth in good alignment and that the relations of the lower teeth on the right side to their opponents are mesio-distally incorrect. All prescribed the same treatment, the application of appliances to widen both halves of both arches until the anteriors were accommodated in the tooth rows and the correction of the mesio-distal mal-relation was secured. None could give the exact forms the finished arches would exhibit and

none had any guide by which to tell when the work was finished except seeing the anteriors fall into line. An engineering survey of this case shows that both halves of the upper arch need spreading, but that only one half of the lower needs to be spread; that is, the teeth on the right side of the lower arch are already far enough from the median line, but those in the left side need to be moved farther from the median line. The first lower deciduous molar on the right side needs to be moved nearly straight forward into correct mesio-distal relations with the uppers; spreading this side would be fatal to the establishment of normal occlusion in this mouth. Models and figures show that the methods of diagnosis were unscientific and misleading. A case is shown which a prominent orthodontist had "regulated" for several years. The work was supposed to be finished with the exception of a few finishing touches to be applied to an upper central which would not align itself correctly. For two years he had pushed at this central in the effort to align it, but without success. An engineering survey of the case showed that the trouble in aligning the central did not arise in the central, but in the fact that the only forms of the arches which would affect normal occlusion had not even been suspected, and the upper arch was 6 mm. too narrow at the bicuspid. The central was being pushed out of alignment by forces not perceptible to the orthodontist and he might have pushed it as long as he and the patient lived without the slightest hope of success. A map of the uppers shows by contrast with the positions in which they should be placed. You will note lack of expansion in bicuspid region and rotation of cuspids and molars. A map of the lowers contrasts with the positions in which they should have been placed. There is pronounced rotation of the left cuspid.—Dr. F. L. Stanton, *Dental Digest*.

Permanent Staff Appointments for the Forsyth Dental Infirmary for Children

A COMPETITIVE examination of graduates in dentistry (of less than three years standing) for appointments to positions on the Permanent Staff for full, and one-half time service will be held early in June at the Infirmary.

Appointments will be made for one or two years as follows:

Full time service requires operating five and one-half days a week at a salary of \$1,000 a year.

One-half time service requires operating six half-days a week, either forenoon or afternoon, at a salary of \$400 a year.

These appointments will be made subject to satisfying the requirements of the Massachusetts State Board of Registration in Dentistry and to "qualifying" in the practical work of the clinics during one month's trial.

Members of this staff will be entitled to the advantages of reports and clinics by experts in the various branches of Dentistry from different parts of the world in addition to the numerous regular clinics and lectures.

Operators after serving three months are eligible, by qualifying, for appointments in the special clinics where Post Graduate work is given.

The operators on this staff have the advantage of the clinics and lectures of the Post Graduate School of Orthodontia.

The Infirmary clinics provide unusual advantages in the various departments of the institution where Operative Dentistry, Orthodontia, Nose and Throat and Oral Surgery, Extracting, Novocaine Technic, Radiography, Pathological Diagnosis and Research Work are continually carried on.

The average number of cases treated daily is more than 450 in all departments.

All material and necessary operating instruments will be furnished; up-to-date apparatus including electric engines, sterile instrument trays, fountain cuspidors, compressed air, and the modern operating room type of lavatories are available for use.

A diploma of service will be issued by the Trustees to each member of this staff who has completed this term of service in a satisfactory manner.

Applications for the above positions should be made not later than May 15th. Information and the date of the examination will be furnished to those interested by Harold DeW. Cross, D.M.D., Director, 140 The Fenway, Boston, Mass.

The Eighth Annual Meeting of the Eastern Association of Graduates of the Angle School of Orthodontia

THE Eighth Annual Meeting of the Eastern Association of Graduates of the Angle School of Orthodontia was held at the Vanderbilt Hotel in New York City on May 7th and 8th, 1917. The following very interesting program was presented:

MONDAY, MAY 7th.

- 9:30 A.M.—The President's Address, Dr. Henry C. Ferris, New York, N. Y.
- 10:30 A.M.—Essay: Some Engineering Principles of Possible Interest to Orthodontists, Mr. G. D. Fish, C.E., New York, N. Y.
- 11:30 A.M.—Essay: Dr. Milo Hellman, New York, N. Y.
- 2:30 P.M.—Essay: Orthodontic Treatment of Advanced Cases, and Patients Coming from a Distance, followed by a Clinic, Dr. J. A. Cameron Hoggan, Richmond, Va.
- 4:00 P.M.—Business meeting and election of officers.
- 6:30 P.M.—Dinner at the Hotel Vanderbilt—Ladies invited.
- 8:30 P.M.—Illustrated paper: An Experimental and Clinical Study of the Isolated Thyroid Hormones, Dr. N. A. Janney, New York, N. Y.

TUESDAY, MAY 8th.

- 9:30 A.M.—Movement of Teeth: Predetermined by Engineering Instruments. Appliances: Designed in Accordance with Analytical Mechanics, followed by a Clinic, Dr. F. L. Stanton, New York, N. Y.
- 10:30 A.M.—Essay and Demonstration: Phonation, Dr. Floyd S. Muckey, New York, N. Y.
- 11:30 A.M.—Essay: The Evolution of the Human Face, Prof. William King Gregory, Assistant Professor of Vertebrate Paleontology at Columbia University.
- 2:30 P.M.—Clinics and Report of Cases:
 Dr. Lowe Young, A Skeleton Bite-plane for Overcoming Deep Overbite.
 Dr. A. L. Johnson, Gnathodynamometer.
 Clinics were also presented by Dr. F. L. Stanton, New York City; Dr. B. W. Weinberger, New York City; Dr. J. A. Hoggan, Richmond, Va.

The Annual Meeting of the National Dental Association in New York City

THE National Dental Association will meet in New York City, October 22, 23, 24, 25 and 26. The headquarters will be at the Hotel Astor, situated on Broadway at 44th and 45th streets. This hotel has the largest ballroom in the world, and this room will be used for all the general assembly meetings. Other large ballrooms will accommodate the Sections, House of Delegates, etc. The exhibits will be shown in the beautiful roof gardens. Thus practically all of the meetings will occur under the roof of this spacious hotel.

Full accounts of the plans of what promises to be the largest and greatest meeting in the history of the association will be published later. Suffice it for the present to state that the slogan for this year will be "Quality rather than Quantity." Nevertheless, there will be quantity also. But the important announcement at this time must be the warning, *reserve your rooms at once*. Make reservations by mail direct to the hotel of your choice. This may seem premature considering the abundance and variety of hotel accommodations there, but New York hotels are always crowded. Nearly seven hundred conventions met there during 1916. October is one of the busiest months. If you desire to get into any particular hotel, therefore, it will be safest to write at once. For example, 150 rooms have been reserved at the general and registration headquarters, Hotel Astor, already. This famous hotel is situated in Times Square and contains 1,000 rooms, the rates of which are as follows:

Single with bath	\$ 4.00	\$ 5.00	\$ 6.00
Double with bath	5.00	6.00	7.00
Two connecting rooms with bath (3 persons)....	9.00	10.00	11.00
Two connecting rooms with bath (4 persons)....	10.00	11.00	12.00

Rates at other hotels vary from \$1.50 without bath to \$4.00 with bath.

A copy of the list of hotels and rates in pamphlet form will be sent to any member of the National Dental Association who will write to the Chairman of the Publicity Committee, R. Ottolengui, 80 West 40th St., New York City, and enclose a self-addressed stamped envelope.

Dr. D. C. Bacon, Chairman of the Committee on Transportation, has issued an announcement of the railroad rates to the Convention as follows:

The Trunk Lines, New England and Central Passenger Associations have granted a rate of two cents per mile in each direction, going and returning via the same route only, limited to midnight of October 30.

Going tickets in Trunk Line territory will be on sale October 19, 20, 21, at the one way fares, on the certificate plan, these certificates to be endorsed by General Secretary, Otto U. King, and to be validated by the Special Agent of the railroads who will be in attendance on October 24, 25, 26. Return tickets to be sold on presentation of validated certificates October 24 to 29 at the difference between the fares paid on the going trip and the fares for the round trip. Return limited to continuous passage to destination and not later than October 30. This applies on tickets with a minimum of \$1.00 for round trip.

New England Passenger Association tickets to be sold or certificates issued

and good going October 19, 20 and 21 and returning not later than October 30, two cents per mile each direction, shore line mileage, going and returning via the same route only.

Central Passenger Association territory round trip tickets requiring validation at New York City will be sold on October 19, 20 and 21 with a final return on October 30, two cents per mile in each direction.

There will be no fee for validation.

Seventeenth Annual Meeting of the American Society of Orthodontists

THE Seventeenth Annual Meeting of the American Society of Orthodontists will be held at Excelsior Springs, Mo., September 5, 6, 7, and 8, 1917. The meeting will be held at the Elms Hotel which is one of the finest hotels in the world. Excelsior Springs, as a resort, is famous the world over, and is accessible by three main railroad lines—the Wabash, the Rock Island, and the Chicago, Milwaukee and St. Paul.

The Board of Censors has arranged the program after the following plan:

I. President's Address, Dr. M. N. Federspiel, Milwaukee; Report of Board of Censors.

II. Anatomy, Physiology, and Etiology.—(1) The Evolution of Dentition, Prof. Osborn, New York City; (2) Further Studies in Prenatal Factors in the Production of Malocclusion, Dr. B. W. Weinberger, New York City.

III. Surgery.—(1) The Surgical Treatment of Extreme Malformations Involving the Jaws, Tongue, etc., Dr. Gordon New, Mayo Clinic, Rochester.

IV. Medicine and Pediatrics.—(1) Diseases of Infancy which Affect Development, Dr. G. Lippmann, St. Louis; (2) Food for Growing Children, essayists selected.

V. Radiography and Photography.—(1) Practical Radiography for the Orthodontist, Dr. E. H. Skinner, Roentgenologist, Kansas City, Mo.; (2) Orthophotography and Multiview Projections, Rudolph L. Hanau, Brooklyn.

VI. Pathology, Prognosis, and Therapeutics.—(1) Oral Efficiency of Therapeutic preparations, Dr. Hermann Prinz, Philadelphia.

VII. Practice and Technology.—(1) Essayist has been selected; (2) Probable essayists, Drs. Lourie, Ellis, Mershon, Cameron, Barr, Wheller, Suggett.

VIII. Legislation, Education, and Nomenclature.—(1) Essayist under consideration; (2) Report of Committee on Education; (3) Report of Committee on Nomenclature.

IX. Clinics.

X. Exhibits.—Books, periodicals, x-ray equipment and supplies, orthodontic appliances, etc.